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PARANASAL SINUS INFECTION

THEIR RELATION TO SOME LOCAL AND SYSTEMIC DISEASES

CASE REPORTS *

C. W. Pond, M.D.
POCATELLO, IDA.

A subject whose scope is as great as the title of this paper implies would require hours of discussion. I shall mention a few of the more serious diseases which to me have been interesting and instructive.

Since the work of Billings about 1910, focal infection has been greatly elaborated in general; in particular dental and tonsil sources have been brought to the fore so there are but few who are not familiar with them. Until recent years the sinuses have been greatly overlooked when hunting for foci of infection. This has been particularly true in children and even in adults, but little consideration has been given them.

By focal infection I mean an infection whose origin is in one part of the body and the symptoms are in another part more remotely situated. Hayden[1] says the systemic expression of a focal infection is the result of the interaction of focus and patient.

A thorough physical examination should be made on all patients. There should be a survey of all the systems, and this should be comprehensive in detail. A patient had his tonsils removed for relief of pain in the forearm and back. No relief was obtained. A detailed examination revealed that the pain was due to a stone in the ureter. When this was remedied the symptoms disappeared.

One can scarcely conceive of more ideal culture grounds for the growth of pathogenic bacteria and the retention of inflammatory products than in the nasal sinuses. They are small bony cavities lined with mucous membrane, which also serves as a periosteum, tucked away in inaccessible recesses. The natural ostea are placed too high for gravity drainage, yet there is no other provision for moving these secretions up and out in the open. The nasal epithelium is provided with cilia. The laryngeal mucous membrane has a like provision so that offending exudates are whipped to the surface and destroyed. While this is true of the sinuses, their cilia are modified and powerless to keep the cavities clean. They hold their products of inflammation like stagnant pools.

Witness the opening of the antrum of Highmore. It is almost at the very top of this large cavity. Again you will recall the outlets of the sphenoids are placed well upon the anterior wall so that residual inflammatory products accumulate and remain undisturbed. One cannot but feel that when the Creator designed these little vents, we were walking on "all fours," and if our locomotion were still in the horizontal instead of the vertical, there would be far less sinus trouble than there is today.

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* Read before a meeting of South Side Medical Society, Twin Falls, Ida., Jan., 1930.

[1] Hayden, Russell L.: Ann. Oto., Rhin. and Laryng., Vol. XXXVI, p. 896, Dec., 1927.

The remaining sinuses, the ethmoids and frontals, drain with ease, their outlets being below the main cavity. You may well inquire why we have so much ethmoiditis if the escape is free and easy. The answer is not difficult. One need only inspect the nose both outside and in the nares to detect malformation in the nasal chambers, high narrow noses, crooked noses, broken noses, and particularly deflection of the septum. In all these conditions the drainage is interfered with and aeration is impossible. The same holds true for the frontal, but here the incidence is much less than in the sinuses below.

The function of the sinuses is probably to secrete a clear mucoid material which aids in moistening the nasal chambers, and in turn warms and moistens the inspired air. Investigators have made note of the long deep nose of the Esquimo and other far northern peoples. They have roomy nasal chambers and large turbinal bodies. The air is cold in the frigid zones and it must be warmed before the air cells of the lungs are filled with it. Contrast this with the African Negro. His nose is flat, shallow and pug. The air he breathes is always warm. Again, our heads would be heavy indeed, if all these spaces were filled with solid bone. Hence another part played by the sinuses is to unencumber the burden on our shoulders and lift the weight therefrom.

The pathology consists of acute and chronic catarrhal inflammations, followed by polyps and polypoid degenerations, cysts and mucoceles. The mucous membrane becomes thickened with round cell infiltration and later, when chronic, some fibrous tissue is deposited in the spots subjected to the most irritation. The chronic granulomata, benign and malignant tumors are found here. For the purpose of this paper, I will take into consideration only the inflammatory processes.

The mechanism by which inflammations advance may be due to abnormal respiratory conditions, mechanical obstruction, dryness and congestion, climatic conditions, living conditions, in which event comfortable breathing is interfered with. Infection may spread by direct extension or by metastasis.

The causes of simple hypertrophy in lymphoid tissue are not definitely known. It is thought to be aggravated by dietary errors. Dean[2] has decided, after careful investigation by the competent staff of pediatrists and laryngologists, that they have found a great majority of their patients come from homes where fats are sparingly used in the diet. Animal experimentation has shown that rats on a fat-free diet are much more susceptible to sinus infection than those on a regular diet. Improvement has been noted after increasing the fat content of the ingested food in a great many patients. Some definite cures have been recorded.

Pathologic changes in one or more of the internal glands have long been known to be associated with nasal disturbances. In other words, a disordered metabolic state is conducive to low resistance and a continuous spread of infection. I have seen hyperplastic ethmosphenoiditis clear up entirely after thyroidectomy. Epidemics of measles, influenza, diphtheria and scarlet fever leave in their paths great numbers of paranasal infections.

Primary infection of the sinuses is not rare. It can and does occur in the absence of other diseases. About 25 per cent of all infections in the maxillary antrum begin with caries at the roots of infected upper molars. In some of these cases bunglesome dentistry has been responsible.

It is my purpose to show you that the sinuses play a very important role in causing systemic disorders as well as local ones. They are responsible for a great many of the nephritides and this particularly in children. Merriott[3] says that "one of the important and clear cut manifestations of infection in the nose is nephritis." He describes two forms, the tubular nephritis or "nephrosis" and the hemorrhagic or glomerular nephritis. Nephrosis is characterized by a scanty output of urine, much albumin, quantities of casts but no blood. There is marked anemia and a normal output of sulphonephthalein, no retention of nonprotein nitrogen. There is marked generalized edema, severe anemia and a normal blood pressure. Again he says: "In practically all cases of nephroses in children, we have found an infection in the paranasal sinuses and particularly the maxillary antrum."

Glomerular nephritis is usually, if not always, caused by a streptococcus and the most common sites are in the nose and throat. This would particularly include the scarlatinal infections. In this form there is usually blood in the urine, retention of nonprotein nitrogen and, in cases of long standing, high blood pressure. To make this more vivid, I shall discuss the following case:

Case 1. T. J., a girl, eight years old, was first examined in September, 1922. She and a twin sister both gave a history of having had repeated attacks of tonsillitis, enlarged cervical glands and pronounced nasal obstruction. They had adenoid faces, were under weight and poorly nourished. Their skins were dry, they were pale and had dark circles under the eyes. They were found to have very marked hypertrophy of both tonsils and adenoids. They were undoubtedly the largest tonsils I have ever seen in children. The cervical glands in both anterior and posterior triangles were enlarged. The nasopharynx was filled with adenoid tissue and the nasal mucosa was turgescent, dark red and covered with mucopurulent discharge. However, at this time I was unable to find any definite infection in the paranasal sinuses that I could not account for by the infected adenoid masses and the marked hypertrophied, infected tonsils.

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[2] Dean, L. W.: Ann. Oto., Rhin. and Laryng., Vol. XXXVI, p. 933, Dec., 1927.

[3] Merriott, McKim: Pediatric Aspects of Otolaryngology. Ann. Oto., Rhin. and Laryng., Vol. XXXVI, p. 686, Sept., 1927.

Both children were taken to the hospital on September 24 and tonsillectomy and adenoidectomy were done. As a routine procedure in the hospital, a urine analysis is made on all tonsil cases and the result recorded on the chart. In this case it was found normal, but I did not know this until I looked it up about three years later. I say it was a routine examination because there were no symptoms that made me think the children had nephritis.

Both patients made uneventful recoveries and went home the following day. Their symptoms all disappeared, they gained in weight, slept and ate well and attended school regularly. In fact, the parents felt that the girls were entirely well in every way.

They were not heard from again until November 15, 1925, or a little more than three years after the tonsillectomy, when Dr. F. M. Sprague called me in consultation at the hospital to see one of this pair of twins. His findings showed that the child had been well since the tonsillectomy until about three weeks before being admitted to the hospital, at which time she, with other members of the family, had been stricken with influenza. All of them suffered alike. They had nasal discharge, enlarged tender cervical glands, some cough, sore throat, nasal obstruction, fever and general aches and pains.

After about one week the other members of the household recovered. This one did not. She was so ill that she was kept in bed. A few days later the mother noticed her urine was bloody, followed shortly by some swelling in the face. Her appetite failed, she was pale, had a high temperature and seemed extremely ill. For these symptoms medical aid was sought.

Dr. Sprague made a diagnosis of acute glomerular nephritis. His findings were some edema over parts of the entire body, particularly the feet, ankles, legs and face. The urine showed great quantities of blood, albumin and occasional hyaline casts, and had a specific gravity of 1013. The reaction was alkaline and the appearance bloody. She passed small amounts at frequent intervals. The blood showed the following: Hemoglobin 60 per cent, erythrocytes 3,400,000, leukocytes 7,800. The blood urea was 23 (should be 12 to 15). The nonprotein nitrogen content was 46 (should be 25 to 30), and her blood pressure was 158/50. Her temperature was 103° F.

You will note that here we have all the classic symptoms of acute glomerular nephritis: slight general edema, moderate anemia, quantities of blood in the urine, increased urea and nonprotein nitrogen and an elevated blood pressure with high temperature, all this following a severe infection in the nose and throat.

After a careful examination of the ear, nose and throat, and a roentgenogram of the paranasal sinuses, I concluded that all of the latter were infected other than the frontals which were not completely developed at this time. A culture taken from the nasal secretion showed a staphylococcus, but later cultures taken directly from the sinuses showed a hemolytic streptococcus.

Due to the acute kidney condition and the extreme illness of the patient, I treated the sinuses daily, deferring any operative work until improvement was noted, if such could be obtained by cleaning the purulent secretions away and promoting better areation and drainage. After the first week, the child had improved so that there was no edema, the blood presssure was lower, dropping to 130/97. The blood was gone from the urine; however, the albumin remained the same. Operation was advised at this time but refused.

At the end of the five week stay in the hospital, or on December 20, the parents insisted on taking her home, only to return in about three months with all the symptoms as before but in milder form.

On March 23, 1926, she was readmitted to the hospital and under light ether anesthesia the ethmoids, the sphenoids and both antra were all widely opened. She then took postoperative treatments in the office along with the ultraviolet ray and diathermy. Considerable improvement of the kidney condition was noted, but I was unable to clear the sinuses up satisfactorily on account of the marked deflection in the septum.

She was again admitted to the hospital on May 26, and under local anesthesia a submucous resection was done. She was then treated until the sinuses appeared well. During this entire time quantities of albumin were present in the urine but she was greatly improved otherwise. When we noted an improvement in the sinuses, the pharyngeal mucous membrane and the cervical glands, and invariably the kidney condition would be better, but when the patient contracted a slight cold, the albumin would increase and the pressure would go up.

During one of these exacerbations, she developed a double otitis media. She was readmitted to the hospital and on February 2, 1927, more than two years after her trouble began, I did a myrongotomy on both drums. This, of course, aggravated the renal efficiency, but after about three weeks of profuse otorrhea, the ear condition cleared up without mastoid involvement. Since this time she has been entirely well other than for a small amount of albumin in the urine.

She has gained in weight, eats and sleeps well and in every way seems normal. We had a letter from her about one month ago stating that she was well and happy and attending school regularly. She is as large and appears as well as her twin sister.

Undoubtedly there has been some permanent damage done the kidney as indicated by the albumin in the urine. However, I feel that the removal of the definite focal infection saved the child's life and, barring any unforeseen trouble, she should live a great many years in good health.

Case 2. L. F. This patient, age 15 years, was referred to me by Dr. E. N. Roberts on November 25, 1925. He gave a history of having had three definite attacks of acute nephritis, each following a severe cold in the nose and throat.

Under local anesthesia, the maxillary sinuses were opened and drained. One week after the operation the urine was normal. He has been entirely well since.

Case 3. C. H., a young, vigorous man of 22 years, referred by Dr. A. M. Newton. He entered the medical service at St. Anthony Hospital with a diagnosis of acute nephritis, followinig an infection of the nose and throat. I made a diagnosis of infected tonsils and empyema of both maxillary antra. I felt that the tonsils were probably the greater offender of the two, and with local anesthesia I removed them. There was but little improvement, if any. Three weeks later I opened and drained the maxillary sinuses. His improvement was rapid from this time on. I heard from him two weeks ago. He states he is feeling well, working every day and a urine analysis shows normal.

Case 4. C. S., a young boy of fifteen years, referred by Dr. C. A. Hoover on October 28, 1926. Following a severe cold, he developed the classic symptoms of glomerular nephritis. With medical treatment by his family physician he improved so that he could get about, but the urine tested albumin, and the blood pressure was up. His feet would swell somewhat. He had severe headaches. A diagnosis of maxillary sinusitis was made. On November 11 I opened and drained both antra. On January 5, 1927, only a faint trace of albumin remained. His blood pressure was normal. He is now well and attending school.

The local condition I am about to discuss with you is retrobulbar neuritis, or an inflammation of the optic nerve behind the globe. Inflammation about nerve tissue first causes loss of function; and where it stops early, function returns; but if it continues, the cells will be destroyed and regeneration is not possible. This is particularly true of the optic nerve.

The most outstanding symptom of this grave malady is blindness. This should suggest to you a deprivation so overwhelming that one would rather choose death or oblivion than to go about in total darkness. It is one of the grave misfortunes that drive people from activity to social ostracism and compels them to resort to charity to keep body and soul together.

A patient may consult you, saying: "Doctor, while working yesterday, dimness came over my left eye and I awoke this morning unable to see across the room." Since complaints answering this description occur in your professional work, it is my hope that I will be able so to clarify the subject that you will at least think of nasal infection as a possible cause.

White[4] of Boston has for fifteen years been working on this question. He has had for his material access to the Massachusetts Eye and Ear Hospital and the Massachusetts General Hospital. He has had associated with him such men as Verhoff as opthalmologist, and as brain surgeon, one no less renowned than Harvey Cushing. He has subjected his patients to the most painstaking physical examinations and submitted his operative findings to critical pathologists in different parts of the country, with the result that a detailed report of fifty-nine cases showed beyond doubt that paranasal sinus infection does cause retrobulbar neuritis and that the eradication of the same has given most gratifying results. Cures amounting to more than 90 per cent were obtained. In this connection, I shall cite a few case histories.

Case 5. A. R. A., age 41, railway switchman. On March 31, 1924, he called at my office, complaining of pain, redness and photophobia in the left eye. He thought he had contracted a slight "cold in the head," but this was not marked.

At this visit I could find nothing other than a deep injection of the sclera and conjunctiva, but not pronounced. The fundus showed some congestion, but the nerve head was not swollen. I thought he had a beginning iritis or episcleritis and treated it accordingly. He visited my office daily without improvement. At each visit I vainly sought for the cause of his trouble.

At his first visit his vision in both eyes was 20/20. By April 12 the vision in the left eye had receded to 20/40. The right eye remained normal throughout. On April 10 I noted on his record it was my impression that the left sphenoidal sinus was infected. By means of the nasopharyngoscope I had detected an inflammatory area in the region of the sinus. On April 14 the optic disc was swollen one dioptre and the vision had dropped to 20/50. On April 16 the nerve head was swollen two dioptres and the vision went down to 20/70.

He began to complain of distortion of images, considerable headache, general nervousness and a nasopharyngeal discharge. Due to the fact that the progress was slow and he was under observation, I treated the nasal condition with conservative measures, with no improvement but rather a slow progression toward complete loss of vision. A roentgenogram of the sinuses showed the left sphenoid cloudy. Other symptoms and findings were more positive each day.

On April 24, or nearly one month after his first visit, I did a complete exenteration of the ethmoids and took down the anterior wall of sphenoid. He made an uneventful recovery and on May 15, three weeks after operation, the optic nerve head had entirely receded and vision in the left eye was 20/30. On June 18 the fundus and disc were normal, the vision was 20/30. On July 30 the vision was 20/20, no redness in the eye and the only thing he complained of was occasionally some slight distortion of images but this was slowly improving. On December 15, the eye was quite normal, the nose entirely well and his health fine in general.

I heard no more from him until just before Christmas of this year. In opening our Christmas cards this one was from him. He is now in Oakland, Calif. He writes: "Dear Doctor: I always remember what you did for me and of course I still appreciate the eye you gave me. I have passed several railroad doctors and seem to get by O.K. If there is any difference in my two eyes now, the one you worked on is the better."

Case 6. J. L. H., age 35 years. Referred by Dr. H. R. Hatch, May 18, 1925. He came to me complaining of almost total loss of vision in the left eye and some dimness of vision in the right. He had no other symptoms. Being interested in remote symptoms to pathology, I questioned him closely. He told me he had never had a "sick day" in his life. He worked hard on his farm and just the day before consulting me he had been cleaning out irrigation ditches with a shovel. I mention this because often with severe infection there does not seem to be any absorption or at least not enough to cause unusual aches and pains, until some fine day something turns up suddenly at a distant point and the individual is on the road to disaster.

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[4] White, Leon F.: Laryngoscope, Vol. XXXV, p. 217, 1925.

His vision was 20/50 in the right eye and he could only count fingers at three feet with the left. The right nerve head was swollen 4 dioptres. The left medium was hazy, the nerve head could not well be made out, but a few hemorrhagic spots could be seen along some of the retinal vessels.

A diagnosis of purulent bilateral maxillary sinusitis was made. The antra were opened and drained on May 11. He made a rapid recovery and when last seen, on June 23, about five weeks later, both fundi had cleared to nearly normal and his vision was 20/20 in the right and 20/30 in the left.

Case 7. M. L., age 23. A nurse in one of our hospitals was first examined May 31, 1924. She complained of blurring of vision in the right eye. The condition started about one week before, following a mild acute rhinitis. Her vision was 20/200 in the right eye. The left was normal. The right fundus was congested and the nerve head swollen 5 dioptres.

I made a diagnosis of sphenoiditis, right side, and treated the sinus for several days, but the condition rapidly grew worse. On June 10 I opened the sphenoid on the right side. On July 1 her vision was normal and the swelling in the nerve had disappeared. I last saw her in September, 1927. Her eye was entirely well.

I would not have you understand that all cases need radical surgery. Many of them recover uncomplicatedly, with conservative treatment.

Byfield[5] says, "from the latest investigations it may be inferred that chronic infection of the nasal sinuses plays no inconsiderable role in producing general septic disease, and the overlooking of this possibility is one reason why the removal of tonsils and adenoids is not followed by a complete cure." He also makes this statement: "In infectious arthritis deformans in children, however, it is of great importance, for the mere exclusion of tonsillar infection will usually not check the disease, whereas sinus operations (at present our only positive way of removing the infection) are almost sure to put an end to further progress of joint pathology and to lead to improvement of the tissues already affected."

CONCLUSION

1. Paranasal sinus infection is responsible for many systemic and local diseases, especially nephritis in children and retrobulbar neuritis at any age.

2. The sinuses are responsible for a great many more systemic disorders than they have been given credit for.

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[5] Byfield, A. H.: Abst. Ped., Vol. 3. Systemic Effects of Infection in Upper Respiratory Tract, p. 778.

MENINGITIS OF OTITIC ORIGIN*

Frank A. Plum, M.D.
HONOLULU, H. T.

It is well for all of us to pause occasionally and consider the advances that the science of medicine and surgery has made within the last few decades. We now perform operations and have methods of treatment that might have made the practitioners of the early nineteenth century tremble with anxiety. Advances require new methods. They may appear to be radical measures, although they allow the mortality rate to be reduced.

As medicine has progressed, various fortresses of untreatable pathology have been crushed before it. A number have remained, and one of the most resistant is meningitis. Percival Pott, in 1760, recognized the need of treating meningitis surgically. But the mortality rate now, as well as then, has remained unchanged, almost 100 per cent. Eagleton, in 1921, made a careful study of the complete literature and could only find a possible thirty cases that had been reported as cured.

In this paper we are considering only meningitis of otitic origin. The factors making up the problem consist of the infecting organisms, the cerebrospinal fluid, the anatomy of the middle ear, labyrinth and base of brain, the usual channels of entrance of infection, the treatment of localized and diffuse meningitis.

THE CHIEF ORGANISMS

The chief organisms to be considered are the pneumococcus, types 1, 2, 3 and 4, streptococcus mucosus capsulatus, streptococcus hemolyticus, influenza bacillus and proteus. In an analysis of a large number of cases, Stewart found the streptococcus in 59 per cent and the pneumococcus in 19 per cent.

One of the chief outstanding differences between treating a case of epidemic cerebrospinal meningitis and one of otitic meningitis, due to the above organisms, is that in the former the cerebrospinal fluid remains limpid or free-flowing. With the above organisms the dense plastic exudate that is formed makes free drainage impossible and really constitutes the great problem of treatment.

CEREBROSPINAL FLUID

The cerebrospinal fluid forms the medium of treatment, its study our guide, and its behavior frequently our despair. It is secreted by the choroid plexus of the lateral, third and fourth ventricles, the quantity present at any time varying from four to six ounces. It was long considered to be absorbed into the superior longitudinal sinus through the pacchionian granules. Recently Weed proposed the subarachnoid villa as a means of its reaching the longitudinal sinus. Dandy objects to this and present very good grounds for believing that it passes directly into the blood vessel capillaries of the subarachnoid space.

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The cerebrospinal fluid has certain interesting laws of permeability. Salts, such as potassium iodide, alkaloids such as curare, atrophine and pilocarpine pass very rapidly from it to the blood, although they do not easily pass from the blood to it. However, it has been proven that in meningitis there is a reversal of this capillary permeability and Flexner and Amoss have made use of this in the treatment of certain cases of poliomyelitis.

Dandy, by his colorimetric method, found normally that 35 to 50 per cent of a dye injected into the ventricles was passed by the urine in two hours and considers that this represents the rate of absorption of the cerebrospinal fluid. Based upon this, he estimates that it is replaced from four to six times daily.

Cerebrospinal fluid only functions as a protective agency when its normal circulation is preserved. To keep up normal circulation, the pressure must be maintained and this, in turn, necessitates that its volume must be kept up. Yet at the same time our hope to cure rests upon drainage of the meninges at the point of maximum infection and bathing of the infected area in a constant flow of normal cerebrospinal fluid.

Two chemical constituents of the cerebrospinal fluid are helpful in determining the progress of the disease in meningitis, namely the chlorides and the glucose. The blood chlorides normally are very constant between 725 and 750 mgm. per 100 c.c. An increase above 750 mgm. may be looked upon as a kidney deficiency and below 700 mgm. as a meningitis.

A rapidly falling chloride content is a bad prognosis, while a rising one is favorable. The same is true of the glucose content. Normal content is 45 to 85 mgm. per 100 c.c. It will fall in every case of meningitis except one due to a nonglucose fermenting organism like the diphtheroid bacillus. Normally the glucose content of the cerebrospinal fluid varies within limits with the blood sugar, but in acute meningitis the blood sugar is commonly raised and the glucose of the cerebrospinal fluid falls. Polonovski and Duhot report a case of epidemic cerebrospinal meningitis with 230 mgm. per 100 c.c. of blood and only 10 mgm. per 100 c.c. of cerebrospinal fluid.

The function of the cerebrospinal fluid has been largely looked upon as protective, to form a water cushion for the brain and to maintain the intracranial pressure. Hart has demonstrated that there is a marked variation in formation at various times during the day, and considers it dependent upon the general vitality curve. Tzanck and Renault believe it dependent upon the deep venous pressure, both being altered by the blood mass.

The cerebrospinal fluid has still another function. It has been proven that the brain substance through it throws off waste products like choline and other lecithin groups and that these, when in excess, cause death in themselves.

Thus we may have three factors in a death due to meningitis, respiratory paralysis due to (1) inincreased intracranial pressure, (2) toxins elaborated by the invading organisms, (3) toxins from waste substance of the brain itself that have accumulated, due to the decreased absorption of the cerebrospinal fluid by the blocking of the subarachnoid capillaries.

PATHS OF INFECTION

The dura under ordinary conditions will act as a safe barrier, preventing infection from reaching the brain during cranial suppuration. The weak points are where it is pierced by nerves and vessels or at cranial suture lines.

The dura of the middle fossa, not being penetrated by nerves or vessels from the ear, is not so apt to be involved, except in children where an entry is gained through the petrosquamous suture.

Otitic meningitis is usually basal, the suppuration lodging in the basal cistern and in the posterior fossa. The usual paths of infection are (1) through the internal ear and internal auditory meatus, (2) from the lateral sinus and from perisinus suppuration, (3) through the dura of the middle fossa, (4) by the general blood stream.

INFECTIONS SPREAD FROM THE INTERNAL EAR

Infection spreads particularly by the lymphatics associated with the seventh nerve, the vestibular and cochlear branches of the eighth nerve. The tractus spiralis foraminosus transmits a small branch of the cochlear nerve to the lower turn of the cochlea. Many of the cases of labyrinthitis associated with epidemic meningitis are believed to become infected by this pathway.

Once introduced through the internal ear, the infection spreads rapidly to the cisterna pontis, then to the cisterna basalis, to overflow along the cerebral vessels to inaccessible parts of the subarachnoid space. The cisterna magna or cisterna cerebellomedullaris is the last of the cisternae to be infected; hence its drainage alone is usually of little avail as it comes too late.

Suppuration from the lateral sinus spreads to the posterior fossa and an abscess described as oysterlike covers the under surface of the cerebellum.

PROGNOSIS AS REGARDS LOCATION

An infection of the middle fossa is looked upon as having the best prognosis. It is limited by the tentorial membrane and it takes longer for an infection to reach the basal cisterns and to become diffuse. It is also here that the meningitis may show the Gradenigo syndrome.

The next most favorable site is in the posterior fossa, where it abuts on the posterior surface of the petrous portion of the temporal bone. Here we find gross anatomic barriers that tend to limit an infection of the meninges, seventh, eighth, ninth and tenth nerves, root of the fifth, cerebellar peduncle and the tentorium cerebelli. The most dangerous area is Troutman's triangle (between the sigmoid sinus and the labyrinth) or in the inner table of the supraspinal cells, as in this last there is a direct access to the cisterna magna.

DIAGNOSIS OF MENINGITIS

The problem as it usually confronts the otologist is similar to this. A young person with either an acute or chronic ear history, possibly a few days after a mastoidectomy, suddenly develops a severe occipital headache that gradually becomes more severe. It may radiate to the frontal region, it is increased by loud noises or movement. A photophobia is probably present, there is vomiting and possibly an irregular pulse, but it is usually distinctly slowed. A cervical rigidity may be present. The patient has a feeling of uneasiness as regards the future, a slight mental confusion may be noted, the temperature rises rapidly and remains elevated. In case the meningitis is complicated by another lesion, as sinus thrombosis, the chart picture will vary.

Upon examination we may find a hyperesthesia of the posterior wall of the external meatus, noted by Mendel. This is due to the auricular branch of the vagus enervating this particular wall being connected with meningeal nerves through the jugular ganglion with a reflex transmission of the pain sense from the inflamed meninges.

Pressure upon the occipitoatlantoid ligament will produce pain. Kernig and Babinsky signs are usually positive.

The cerebrospinal fluid in a typical case is as follows:

Early stage of meningitis. Fluid is clear or slightly opaque; pressure varies. Cell count is increased above the normal of four.

Stewart says "it must be remembered that in infants 20-30 cells per c.mm. occur usually and that the number decreases with the years until the normal four cells is reached in the adult."

Glucose is unaffected. Globulin is present as a trace. The meningitis curve is absent, no bacteria.

Late stage. Fluid is turbid; may show pure pus. Pressure varies but generally considerably increased. Cell count is usually increased to thousands; 90 per cent polys often (in tuberculous meningitis occasionally but 20 per cent polys).

Bacteria are isolated in 90 per cent of cases. Glucose and chlorides fall. (In sigmoidal sinus lesions not associated with P. M. the sugar is increased). Globulin content increases. Gold curve 0 111 333 100.

In meningitis the cerebrospinal fluid shows a leucocytosis. McKenzie points out differential diagnosis in this respect from encephalitis lethargica, in which a lymphocytosis without bacteria is present instead of a leucocytosis. The early symptoms in meningitis are due to irritibility, the late ones to paralysis.

In brain tumor we may within reason operate at our leisure; in brain abscess a reasonable delay is advantageous; but in meningitis we are dealing with a rapidly advancing condition that makes every hour vital and a delay of twenty-four hours may give us a diffuse meningitis with its lamentable mortality of nearly 100 per cent. We must be on our guard against meningism, for it is usually not this we are dealing with but an early meningitis. Meningism is really only found in very young children and it can be cured with paracentesis of the ear drum. If this does not cure it and one finds a beginning cervical rigidity, he is dealing with early meningitis.

A lumbar puncture is advisable but in an early case it may not help. If you find a purulent fluid with bacteria, you are usually too late and in an early case the fluid will probably be clear. As previously stated, a lumbar puncture should be done slowly and carefully and the fluid cultured. Some of the English authorities advise against an early puncture, fearing it will hasten a spread of the condition. Kolmer in this country advises it but with limitation.

Granted that we are satisfied we have an early localized meningitis, the general consensus of opinion is that immediate drainage of the focus of infection is necessary. That means a very thorough mastoidectomy in case of chronic otitis media, and a reoperation in a recently performed operation.

In considering a case of meningitis our attention is immediately directed to the labyrinth.

LABYRINTHITIS

A purulent labyrinthitis arising from a chronic or acute mastoiditis is usually the spark that causes the outburst of meningitis.

1. The labyrinth may become involved by direct necrosis of the bony capsule, particularly at the promontory and the external semicircular canal, the latter the more likely according to Braun and Freisner.

2. The infection may enter through the oval or round window, the round being the more likely of the two as anatomically it is less resistant than the oval.

With a circumscribed labyrinthitis, there is associated a serous infection of a diffuse nature. With an erosion of the outer capsule it is possible for a serous labyrinthitis to cause complete destruction of the function of the inner ear by pressure necrosis alone.

Almour says, "Clinically it is impossible to differentiate a diffuse serous and a diffuse purulent labyrinthitis. Both present an exceedingly stormy picture at the onset, spontaneous nystagmus, vertigo, vomiting and labyrinthine ataxis. Both may follow a chronic suppuration of the middle ear and both show a gradual cessation of the symptoms as the lesion progresses toward recovery or toward destruction of function. Both have a high temperature; caloric tests will show a hyperstimulation of the end organs. While it is true that a purulent labyrinthitis will destroy cochlear and vestibular function, it is equally true that a serous labyrinthitis of sufficient extent will destroy function, if the intralabyrinthine pressure becomes too great. Here our functional and differential tests are limited."

Kopetzky in a recent paper on the subject draws the following conclusions:

1. In a circumscribed purulent labyrinthitis regardless of extent, if the cerebrospinal fluid shows normal chemical and cystologic findings and no bacteria, surgery of the labyrinth is not indicated.

2. In a diffuse serous labyrinthitis, due directly to a pathologic condition of the middle ear or mastoid, no surgery of the labyrinth is indicated.

3. In both diffuse serous and circumscribed purulent labyrinthitis removal of the causative factor is sufficient to result in a cure of the lesion.

4. A diffuse purulent labyrinthitis requires labyrinthotomy only when the cerebrospinal fluid shows evidence of a threatened invasion of the subarachnoid space.

5. Surgical measures are useful in early stages only, and the operative procedure should be based upon the organism present and the pathway of infection.

6. An infection through the fossa gives most hope for the future.

7. In a purulent labyrinthitis, the cerebrospinal fluid may not show organisms but operative measures should be instituted early upon the clinical syndrome and an associated purulent labyrinthitis.

8. In children the mastoid and petrous are very pneumatic and in them particularly the advent of the Gradenigo syndrome constitutes a clear indication for immediate surgical interference.

Eagleton says that in a serous labyrinthitis there is no fever from it, although there may be from the diseases causing it.

Fifth and sixth nerve symptoms occur in the slightest inflammation of the dura and the inflammation may be transmitted a long way. By a study of the fifth and sixth nerve involvement it is possible to determine if we have a disease of the apex of the petrous portion. In that case the basal cistern will be involved and death will result, if it is not drained.

A purulent labyrinthitis may cause a meningitis; also, conversely, a meningitis may cause a labyrinthitis. This is particularly true in epidemic cerebrospinal meningitis. Kerrison lays considerable importance on the mental irritation as showing increased intracranial pressure.

We must constantly be on our guard against the danger of considering a condition to be a meningitis or a sympathetic meningitis. Almour says that every sympathetic meningitis is surgical unless due to a brain abscess. The otitic meningitis that gives promise of the best results is the one that follows the acute coalescent or chronic mastoiditis, and in case surgery is indicated before organisms are obtainable in the spinal fluid and where the spinal fluid shows the minimum amount of colin, particularly if the middle fossa is involved.

Regarding chronic ear conditions in children, Cox and Dwyer, in a recent report on tuberculosis of the midear, state that in their investigation of chronic ears over 50 per cent of cases under one year of age were tuberculous.

OPERATIVE TREATMENT

After removing the original focus of infection the basic principle of treatment is that of drainage of the cerebrospinal fluid. This may be continuous or at intervals. It may be indirect as through lumbar puncture or direct from the site of infection through its dura. Most authorities agree that the type of drainage selected should depend upon the pathway of infection.

Direct drainage through the labyrinth into the internal auditory meatus is highly recommended. In this case it is advisable to know whether or not you are dealing with a dead labyrinth. Scott recommends an inferior vestibulotomy rather than the Neumann operation. He gives a landmark. The bimeatal transcephalic line lies straight along the external meatus below the seventh nerve, leading directly into the internal auditory meatus. He also states that in an anesthetized patient the labyrinth may be sprayed with ethyl chloride; in a live labyrinth the eyeballs will deviate but there will be no nystagmus due to the ether.

The cisterna pontis can be drained by exposing the dura behind the lateral sinus and entering. A lateral recess of the cisterna extends a little beyond the internal auditory meatus. Jenkins is greatly in favor of a lavage of the infected area with Lock's solution, the solution entering through a lumbar puncture and being allowed to escape through the internal auditory meatus.

At every mastoid operation Kolmer advises that a culture be made on blood sugar or dextrose hormone broth. If expert bacteriologic study reports back a pneumococcus or streptococcus, a careful watch should be kept up for a possible meningitis.

If the infection is due to a pneumococcus he advises immediately giving 20-25 c.c. of Huntoon's antibody serum intravenously. In pneumococcal meningitis he advises one or two lumbar punctures daily and the slow removal of 10-20 c.c. of fluid. He then injects by gravity 10-20 c.c. of antibody serum, also containing 1 c.c. of a 1:100 solution of ethylhydrocuperine hydrochloride.

In streptococcal meningitis he advises antistreptococcal serum intraspinally and also intravenously. If the condition progresses so that you find organism on direct smear, intravenous and intraspinal measures will prove futile.

In diffuse cases of meningitis there are two problems: (1) The clearing of the ventricles, basal cisterns and the spinal subarachnoid area. (2) The clearing of the extensive cerebral subarachnoid area. Ventriculocisternal spinal lavage may clear the former.

In much of his experimental work and in humans he found at autopsy that the base of the brain had been entirely free of organisms and exudate after the lavage but that the cerebral meninges had not been affected. He then began to advocate the bilateral cerebral lavage through double trephine wounds in the frontal region. Stewart has used this method experimentally and has obtained very satisfactory results, but again it demands the use before the exudate becomes too plastic.

Kolmer is convinced that in the diffuse cases surgical drainage and cerebral lavage offer the only hope at the present time. To assist this treatment he advocates the introduction of the solutions in the common carotid arteries. Experimentally he has found that gentian violet and other dyes have shown an intense and widely distributed concentration of the inoculum in the cerebral and basilar meninges, reaching as far as the upper part of the cord along with the passage of a portion into the cerebrospinal fluid.

Hirsch, Myerson and Halloian have given intracarotid injections of neoarsphenamine and sulpharsphenamine in the treatment of paresis. This has been given with ease and safety for the patient. Kolmer states that the intraarterial route may be used with practically no bleeding, that the method is both simple and safe and that the toxicity of the substances introduced is no higher per kilogram of body weight than by intravenous injection, and that intense concentration of the inoculum apparently occurs in the cerebral meninges.

He has used the bilateral carotid injections in several experimentally produced cases of pneumococcal meningitis in dogs and states that the results have been most encouraging. They have, of course, been used in conjunction with cisternal drainage and intracisternal and intraspinal medication. About 60 per cent of the dogs recovered from pneumococcal meningitis produced by the intracisternal injection of virulent type I organism.

Kolmer's method:

1. Ether anesthesia.

2. Puncture of the cisterna magna, removal of the purulent fluid, the needle left in position.

3. Injection of 1 c.c. of pneumococcal antibody

solution or antipneumococcal serum with ethylhydrocuperine hydrochloride (24 c.c. of former with 1 c.c. of a 1:100 solution of the latter) into each common carotid artery per kilogram of weight.

4. Intracisternal injection of 3 c.c. of the mixture per dog (from 3-5 kg. of body weight), followed by withdrawal of needle.

As a general rule, three treatments at daily intervals were given. Kolmer states that the methods have not been tried with types II, III or IV or with streptococcus.

He states that for adults and children over twelve he would advocate the injection of 25 c.c. of the pneumococcal antibody ethylhydrocuperine hydrochloride solution into each common carotid artery and from 5 c.c. to 10 c.c. into the great cisterns, in one-half amount in children under twelve. In streptococcal meningitis use polyvalent antistreptococcal serum in similar dosage without the ethylhydrocuperine or the injection of 15 to 20 c.c. of a .5 per cent solution of acriflavin in base into each artery.

Kolmer advocates the above method very highly. He states that in his experimental work on dogs he has had about 60 per cent recoveries. In the light of our present unsatisfactory results these methods are certainly worthy of very serious consideration.

SUMMARY

1. Our present mortality rate is as high as any pathologic condition that we are called upon to treat.

2. Part of the problem of treatment is due to the heavy plastic exudate.

3. A diagnosis of meningism often causes a fatal delay.

4. Our diagnosis must not wait for a turbid spinal fluid containing organisms.

5. Our only success will depend upon operative interference, and this entails (a) removal of the focus of infection, (b) drainage of the subarachnoid, dependent upon route of infection.

6. A careful bacteriologic study of every mastoid operated upon is essential.

7. In pneumococcal or streptococcal infection the immediate use of antibody serum or antistreptococcal serum is demanded.

8. In diffuse cases we owe our patients all we can give them and that entails drainage, intracranial lavage both cerebral, cisternal and spinal, and a trial of Kolmer's intraarterial medications.

THE COMMONER EAR DISEASES *

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FURUNCLE OF THE CANAL WALL

The principal symptoms in these cases are itching and pain. The pain may be so severe as to prevent sleep, and of a throbbing character. The deeper the process, the more severe the pain and the more protracted the spontaneous rupture, as these tissues are quite dense. Traction on the auricle, as we are all aware, generally aggravates the pain and helps us to diagnose the seat of the trouble.

Often there is slight swelling, no pointing and little, if any redness, contrary to textbook indications. The skin may have a soggy appearance. Where there is no pointing, it may be necessary to temporize twenty-four hours by the use of an eight per cent phenol in glycerin and a pack of gauze strip soaked in twenty per cent icthyol in glycerin. Touching the area with pure phenol may bring the furuncle to a head.

If located in the lower part of the concha, the process may infiltrate the whole thickness of the auricle so as to cause an actual edema of tissues over the mastoid tip. On three occasions I have been deceived into thinking these were actual mastoid symptoms, but a delay of forty-eight hours with incision in the canal and application of heat and moisture revealed the condition.

Early incision of these furuncles is apt to be disappointing. Even waiting until a definite pointing is established may entail a second opening. In my experience, since the anesthesia is so brief and recovery so quick, I find that ethyl chloride is almost ideal for this purpose, and comparatively slight nausea results.

Incision of these furuncles is more painful as a rule than paracentesis of the drum, and in nervous patients requires a general anesthetic, especially as they should be curetted, if a deep involvement is present and cauterized with the use of a cotton tipped applicator soaked in ten per cent silver nitrate or phenol to promote sloughing of infected tissue. This should be followed by a moist pack changed daily till healed, as there is a marked tendency to recurrence. Some of these patients require tonics and general treatment.

MYRINGITIS

The symptoms are pain, redness of the upper part of the membrana tympani, with little if any

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* Read before Lewis County Medical Society, Centralia, Wash.

obscuration of landmarks. Bulging of the upper portion of the drum may occur later.

Blisters sometimes develop, showing a separation of the outer dermal layer of the drum head. Hence it is recommended in operating to simply perforate this epidermal layer, allowing escape of serum, a procedure easier said than done, since one is supposed to leave the drum proper intact. Especially is this true, if the canal is narrowed by inflammation curtailing the field of view.

Since our principal symptom is one of pain, we are called to diagnose this condition from pain in an upper molar radiating backward, neuralgia (by appearance of drum), pain of tubal congestion which usually can be relieved promptly by inflation, acute otitis media diagnosed by pain, deafness, mastoid tenderness and bulging of drum. Of course, myringitis is often associated with tubal congestion.

Treatment. Opening of eustachian tube, shrinking the mouth if necessary with adrenalin, followed by inflation with head of patient bent to the opposite side: this may expel serum present. The most effective drops for local use are equal parts of cocain, oil of cloves and carbolic acid. But as these have a cauterizing action, the use of heat to relieve pain after evacuating the serous accumulation is recommended, preparatory to incision and remembering that effective anesthesia may require ether or chloroform. A phenol glycerin mixture is also advised, though less effective after paracentesis is done.

ACUTE CATARRHAL OTITIS MEDIA

This comprises thirteen per cent of all ear diseases.

Etiology. As these cases seldom are accompanied by rupture of the drum or much fluid, bacterial infection is of only secondary importance. No special organism seems concerned in this malady, though often associated with a combination of diplococci, pneumococci, streptococci or staphylococci.

Hence the predisposing factors are of the greatest importance. Briefly these comprise exposure to weather, especially in the presence of chronic rhinitis and sinusitis, dry heated air of houses resulting in rhintis sicca and allied troubles, and other nasal diseases and nasal obstructions, such as spurs and deflected septa, causing a tendency to vacuum formation in the epipharynx; ethmoid and sphenoidal disease which, through their secretions flowing into the epipharynx, excite inflammatory conditions of the mucous membrane extending by continuity to the eustachian tube; postnasal adenoids, causing tubal closure; enlarged or diseased faucial tonsils through interference in the function of the palatopharyngeus muscle, resulting in atrophy of its fibers; adhesions in Rosenmueller's fossa.

Pathology. The tympanum contains serum, mucus and epithelial cells.

Symptoms are similar to those in acute purulent otitis media, but less severe. Onset is signaled by a slight chill. The temperature runs from 99° to 101°. The pain is of a dull or aching variety which may become severe and pulsating. The drum is red, thickened, and if exudate exists, may be bulging. Tenderness of the auricle and over the mastoid antrum is apt to be present. Often there are tinnitus and dizziness.

The second stage shows disappearance of fever, pain and redness of the drum; the latter may become greenish. In some cases a water line across the drum indicates the height of exudate within the tympanum. Hearing is impaired during the attack. Bulging of this membrane calls for incision to relieve pain and prevent further tissue destruction.

Pain may be relieved by the use in the ear of drops, composed of menthol, phenol and cocain in equal parts, or blowing in the fumes of chloroform.

Tympanic inflation is limited in efficiency to the second stage of the disease. During this time it may be used with caution daily. By this means the tympanum and eustachian tube is kept free of secretions and resulting adhesions between ossicles and the wall of the middle ear. This is best done through a eustachian catheter. If the opening in the tympanum tends to gap, it may be inadvisable to begin inflation early, on account of preventing the tympanic opening from final closure. Pneumomassage given with a compressed air apparatus is advisable in the later stages.

ACUTE PURULENT OTITIS MEDIA

So much has been written on this subject that it is impossible to add anything new, but any condition such as this that presents itself so frequently as a complication of acute infectious diseases is pertinent at a time of year when the exanthemata are apt to be epidemic. Besides these as causes, we may note colds, chronic rhinitis, tonsillitis, acute and chronic diseased tonsils, the exciting cause being pathogenic bacteria.

Among the infections in older patients, none seems so prone to cause purulent otitis as influenza, and, with or without spontaneous rupture of the drum, to develop a mastoiditis. In fact, the otitic symptoms are scarcely noted in some instances before a full blown mastoid infection is discovered. The treachery of onset in these influenzal cases should make us doubly watchful of any middle ear symptoms.

Among the symptoms we most often see are headache, pain in temple, and radiating from the ear downward into the great vessels of the neck of a pulsating character, tinnitis, deafness, a swollen edematous, scarlet drum head that soon becomes bulging. The fever ranges from 100° to 104°.

The presence of *desquamated epithelium* may so obscure the entire surface of the tympanic membrane as to confuse the diagnosis, until this is removed and the inflamed surface brought to light. Few textbooks mention this very common condition, and many patients will report that their doctor could see nothing the matter with the ear and put in a little mullein oil and black pepper to bury the offending condition further out of sight. Too many of us, as in a case I recently saw treated in this way, are apt to think the outcome good because the ear symptoms cleared up after two or three weeks. But suppose, as in the case mentioned, hearing is reduced to 15 or 20 per cent of normal, with a probability of further loss. A prompt paracentesis would probably have reduced greatly the time of disability, the risk to life and almost certainly the loss of hearing. Ballenger claims these cases should not be irrigated unless it be done very gently, declaring that cases of myringitis are thus converted into otitis sometimes.

The headache may involve the entire side of the head with extensions to the occipital region, and there is pain on moving the jaw. There may be edema and redness over the mastoid tip and there is usually some tenderness over the tip on deep pressure, also over the mastoid antrum. The posterior cervical glands are swollen and the lymph nodes just below the ear are often enlarged and tender.

Marked deafness and a pinhead opening in the drum that pulsates are confirmatory signs. Rupture of the drum within five to six hours of the onset sometimes occurs; the discharge is of a serous character during the first thirty-six hours, becoming thicker after the second day.

The blood count is not characteristic, showing simply increased leukocytosis and polymorphonuclears. The bacteriology of 120 cases showed 55 of nonhemolytic streptococcus and 49 hemolytic streptopyogenes.

Prognosis. This is good, if prompt evacuation of pus is secured before complications have occurred.

Treatment. Secure the reaction of inflammation by increasing hyperemia, nutrition, leukocytosis. Hence the use of heat, either by hot water bag or radiant heat as with a therapeutic lamp. However, Ballenger admits that this is secondary to leeching and surgical measures. Hot irrigation, if continuous from a fountain syringe, is very comforting in the stage before perforation. Leeching, applied by placing three to five leeches over the mastoid and one in front of tragus, reduces congestion and favors resolution, though they are not easy to obtain. Establishment of free drainage, it must be admitted, does not afford immediate relief to all patients. However, it is the safest thing to do after a reasonable delay.

Indications for surgical intervention, according to Kerrison, are earache with increasing temperature, relative deafness, inflamed and bulging membrana. Prompt incision in the majority of cases prevents mastoiditis. The period of recovery is shortened. Healing and restoration of normal functions are more assured. Surgical law is that confined pus must be evacuated.

Kerrison favors repeated myringotomies, if required to secure drainage, but others say this is a mistake. Some cases can be opened to advantage, it would seem, at least twice before resorting to mastoidectomy.

ACUTE MASTOIDITIS

Nearly all middle ear cases are temporarily complicated by mastoiditis. The symptoms are those of retention. Pain, redness and swelling, tenderness on pressure appear over the mastoid tip and antrum. With a sudden increase in temperature may come rigors. While some show no appreciable increase in temperature, others may rise to 104°. Pain beginning behind the ear may radiate forward toward the teeth and mastication be painful. The cervical glands are enlarged. The skin over the mastoid is swollen and the auricle may show marked protrusion, especially in periosteal mastoiditis.

The redness and swelling of the posterior superior wall is due to the breaking down of pneumatic cells between the antrum and the auditory meatus. This is considered a pathognomonic sign of mastoid infection. Nearly always the drum is perforated and granulomata may protrude through the opening. Removal of these may relieve symptoms but without securing a cure, since mastoiditis may remain latent for years and culminate in an alarming exacerbation. Spontaneous cure is looked on rather as a remission.

Treatment. If seen before spontaneous perforation, a long incision in the membrana tympani is best. Cold may be used the first thirty-six hours, but not later than this. Leeching is more efficient. Relief of symptoms does not constitute a cure, if they continue after remission. If tenderness and discharge are maintained over three weeks, operation is called for.

Indications for operation on mastoid are continued pain after paracentesis, or a good drainage is established, a chronic discharge, bulging of posterosuperior wall. If with these there is a tender and swollen mastoid, we should not await further danger symptoms, especially in the presence of fever.

Chronic otitis media predisposes to acute exacerbations of mastoid symptoms and usually precedes the onset of chronic mastoid disease.

Periostitis of the mastoid causes a striking bulge outward of the auricle which assumes a position almost at right angles to the normal. The pus being superficial, fluctuation is easily made out. The swelling may extend far up on the scalp, and it may involve the lymph glands over the mostoid tip.

Though the pus appears superficial, the origin being from the tympanum through the aditus into the antrum of the mastoid, the bone overlying it is usually carious at some spot, generally over the antrum. The condition is more often found in young children, in whom the mastoid cells other than the antrum are not developed.

CHRONIC CATARRHAL OTITIS MEDIA

This is probably the most unsatisfactory form of middle ear trouble from a therapeutic standpoint, next to otosclerosis. The onset is gradual and insidious. Often there is a history of frequent colds and tonsillitis, acute and chronic in childhood and early adult life. Remains of adenoid growths and adhesions in Rosenmueller's fossa are often to be found. Many cases are associated with deviations of the septum, septal spurs and chronic sinusitis.

Aside from deafness and tinnitis, there are no symptoms. Patients with a persistent tinnitis are more often those with an associated high blood pressure. Some are even rendered hypochondriacal by a persistent tinnitis.

Treatment. Septal spurs and pharyngeal growths should be removed. Politizerizing or inflation by catheter and massage over the mastoid may be tried for a period of three weeks. If no benefit within this period results, none is likely.

The use of diathermy has gained some advocates, but the data from it are insufficient to generalize on.

CHRONIC MASTOIDITIS

In this condition, where symptoms are so often obscure, it is useful to remember that we may find no other symptoms than those of chronic otitis media.

On account of the sclerosing process in the cells, these may be obliterated. Hence there is no pain over the mastoid. Neuralgic pains are often complained of and are apt to be intermittent, although severe at times. The skiagraphs show a dense ossifying process. The antrum is smaller than ordinary. The drum head is partly or wholly destroyed.

Necrosis of the incus and the other ossicles is indicated by the presence of foul odor and bone sand in the discharge. Increased discharge is often found, but scanty discharge is more often in evidence.

Granulations or polypi in the middle ear may be the only signs of a deep seated mastoiditis, and these generally signify mastoid infection. If after cleaning the canal and middle ear, pus is seen to trickle from the attic, it shows presence of antrum disease beyond a doubt. The skin over the mastoid may be slightly red and swollen or hyperemic.

Cessation of discharge accompanied by increase of pain is evidence of obstruction to drainage. Acute exacerbations are apt to occur every few months.

Some patients explain that their ears begin to discharge as soon as they contract a cold. In some the discharge is so slight as to escape attention unless the attic is explored. A patient with a chronic mastoiditis is likened by one authority to a person with a charge of dynamite in the head.

Prognosis varies with extent of necrosis and the focal center.

Treatment. The mastoid cells should be opened after a moderate trial of local measures, indications being persistent tenderness over mastoid with or without discharge, polypi and discharge, fistula into roof or wall of canal, caries of attic and ossicles, paralysis of the seventh nerve, labyrinthine involvements, intracranial complication, as extradural abscess, lateral sinus infection and thrombosis.

Medical treatment includes dry gauze method, introducing a wick into the middle ear after a wide opening. This is less in favor than formerly, but useful in many cases. Apply suction treatment, combined with politzerization, forcing the discharge into the canal.

Use alcohol or boric acid in alcohol after a thorough cleansing to dry out or remove the last vestige of water. Tincture benzoin compound is of special value where otorrhea is combined with odor. Syringing is useful when discharge is scanty and tenaceous.

Surgical treatment comprises a thorough opening and removal of all infected cells in the mastoid, the establishment of direct drainage between the exenterated mastoid cavity and the tympanum, the removal of the posterior bony meatus, leaving only a small bridge to protect the passage of the seventh nerve, the removal of all granulations and polypi from the middle ear, insertion of tube to secure drainage through outer wound, or a plastic operation to secure drainage from the mastoid into the meatus externally.

CONCLUSIONS

1. Middle ear disease comprises over sixty per cent of all ear maladies.
2. A majority of acute otitis cases occur in children.
3. The exanthemata and hypertrophies, or infections of tonsils and adenoids, including the nasal passages, cause eighty per cent of middle ear disease in children.
4. A large share of catarrhal otitis thus has its inception in childhood and develops later into the chronic type.
5. Treatment of middle ear complaints must aim at the prevention of acute and chronic rhinitis, tonsillitis and adenitis.
6. The majority of acute otitic cases have mastoid tenderness or pain extending into the neck.
7. Incision of the drum so as to insure drainage by a wide opening is the safest procedure in acute purulent otitis media.
8. Early paracentesis lessens the danger of mastoiditis, shortens time of recovery and disability, and lessens loss of hearing.
9. Mastoiditis results oftenest from neglect of middle ear disease, either by the patient or the doctor, and an ear that continues to discharge cannot be considered cured, although other symptoms have subsided.
10. Chronic otitis with purulent discharge is usually associated with mastoiditis.
11. Accurately oriented roentgenograms are useful as a positive element in diagnosis, confirming clinical findings, but of themselves are inconclusive. Sixty per cent of the mastoid roentgenograms made in our A. E. F. clinic were inconclusive or misleading.

MYRINGITIS BULLOSA

ITS SYMPTOMS AND ETIOLOGY*

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It is somewhat startling that in looking over the hand and textbooks of otology one does not find a description and hardly any reference to the subject of myringitis bullosa. It seems that only the Viennese otologic school has paid any attention to that interesting disease. Moreover, in the latest published "modern otology" by Keeler, one finds a chapter about diseases of the drum, but the name of myringitis bullosa is not even mentioned. This author claims that most otologists believe there are no diseases of the drum alone, because either the middle or the external ear will be always sympathetically affected, if any pathologic changes in the drum are present.

Contrary to this opinion, I believe I am justified in making the statement that there are diseases of the drum, where it only is affected. Making this statement I am thinking especially of myringitis bullosa, which I claim to be a disease sui generis of the drum.

As to the symptoms. The patient is suddenly attacked by severe pain without any prodromal symptoms, quite frequently at night. The pain is stinging, mostly radiating against the occiput, including the auricula and increasing rapidly. Usually it lasts only two or three hours, but can go as long as one or two days. Outside of these sharp pains the patient feels well, has no fever and no decrease in hearing.

The picture of the drum shows one or more smaller or larger vesiculi, which stand out very sharply, appear transparent and are filled with a honey-colored, clear fluid. The drum itself around the vesiculi appears perfectly pale and normal, showing all details, with a possible dull reflex. The moment the vesiculi have reached the highest point of development, the pain stops at once and the blisters either burst or collapse, in this way relieving the tension or resolving spontaneously. In this stage the patient usually comes to the clinic or office after a sleepless night, telling that as soon as the ear stopped hurting, it started to discharge a clear yellow fluid. Whether the onset of pain and the appearance of the blisters are simultaneous, or the pain is starting only after the tension in the blister has reached a certain point is hard to determine, as one will hardly have a chance to see a patient right before the pain has started.

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In a certain number of cases the process comes to an end with the rupture of the vesiculi. In others these described symptoms are only the first stage which is followed by a symptom-complex, described by Neumann as secretoric catarrh. A few days after the rupture of the blisters on the drum the patient complains about a marked decrease of hearing, with a sensation of fulness in the ear, and more or less roaring or ringing. The drum gets more and more the appearance of the middle ear catarrh with an oily surface, transparent and, dependent on the amount of fluid in the middle ear, showing a surface of fluid.

In rare cases the described symptoms can be combined with a polyneuritis, which might extend to the trigeminus, facialis, cochlearis and vestibularis. Quite frequently one can observe simultaneously the appearance of an herpes eruption on the lips or face. I have seen a girl who showed simultaneously a myringitis bullosa eruption in one ear with an herpes labialis and genitalis. If one can work on big material in a clinic, one can observe individuals, in whom the myringitis bullosa occurs repeatedly as in herpetic patients.

It might be well here to make a few remarks about the differential diagnosis. A great many otologists defend the standpoint that all vesicular developments on the drum are a part of a beginning otitis media. Contrary to this, we believe there is no inflammatory affection of the middle ear which does not show at least some infection of the drum, especially around the malleus and a marked decrease of hearing. True it is, that the drum picture of an otitis media can be accompanied by blistering of the drum and these are the cases where we see the myringitis vesicularis hemorrhagica.

This latter has no relation whatever to myringitis bullosa and has to be looked upon merely as one of the polymorphous appearances of the drum in otitis media. The more severe the inflammatory process of the middle ear, the more severe usually the blistering of the drum, either hemorrhagic or purulent. But in these cases we will always find general symptoms as well. Naturally the blistering can extend over the limits of the drum and affect the canal, but these cases necessarily will differ from the above mentioned symptom-complex of myringitis bullosa by general symptoms as fever, general malady and decrease of hearing. Knowing that, one will not make the mistake, as I often have seen, of lancing the ear in a myringitis bullosa. In so doing, one might, inestad of accomplishing something constructive, infect the middle ear.

The first who mentioned the name myringitis bullosa was Politzer[1] in his textbook and in his atlas of drum pictures. But he did not classify this picture as a disease of its own. Neumann[2] and Ruttin[3] reported about examinations which showed the serum content of the blisters to be sterile, and meant that the myringitis bullosa is an herpes eruption. Other authors, Heymann[4] and Gatscher,[5] wish to associate myringitis bullosa with a nervous lesion, similar to the idea we have about herpes zoster.

In discussing the etiology of the myringitis bullosa, I want to refer to experiments I made in 1924 to 1926, together with R. Kraus. I will take the privilege of repeating these briefly.

Experiment 1. The content of a fully developed bulla of myringitis bullosa was taken with a sterile capillary and injected in the subdural space of a rabbit. On the ninth day the animal showed distinct encephalitic symptoms with convulsive movements and later on with spasm or paralysis. Death occurred between the twelfth and twentieth days. The same experience could be shown in further experiments with the brain of the diseased animal. The histologic examinations of the brain showed a typical meningoencephalitis which extended in some cases as far as the cerebellum and the medulla oblongata.

Experiment 2. The sterile content of a vesicula of myringitis bullosa was placed on the scarified cornea of a rabbit. On from the third to the fifth day a keratoconjunctivitis with chemosis and frequently pannus could be observed, a process which usually healed within three or four weeks with more or less scars.

Experiment 3. If the brain of a rabbit, which was infected subdurally with myringitis bullosa content two weeks previously, was inoculated on the cornea of a rabbit, the symptoms of a keratoconjunctivitis developed after the same incubation time. The microscopic examination of the cornea showed an ulceration and separation of the epithelium of Bowman's membrane with vacuolization within the epithelium. Similarly to the experiments of inoculation encephalitis, the corneal inoculations also can be kept on experimentally. From the experiments of Grueter[7] and Doerr[8] we know that the cornea of the rabbit is an elective culture medium for filtrable viruses and neither streptococci, staphyloccoci or pneumococci will produce a keratitis in that animal. I have inoculated two rabbits with a blister content of cases where the blisters were just a symptom of an otitis media. In none of these cases could any symptoms be produced on the cornea of the rabbits.

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1. Politzer: Textbook on Otology, last edition.
2. Neumann: Transactions of the German Otolog. Soc., Bremen, 1907.
   idem, Handbook, Denker Kahler, Vol. 7, 1926.
3. Ruttin, E.: Oto. Transact., Nuerssberg, 1921.
   idem, Wien. klin Woschr. No. 41. 1913.
4. Haymann: Transactions, Nuernberg, 1921.
5. Gatscher: Vien. Oto. Lar. Soc. March 30, 1925.
6. Ullmann, E. V.: Mschr. f Ohr und Lar. Rhin. Heft 1. 1929.
7. Grueter, W.: Monatch. f Augenheilk, XV, p. 398. 1920.
8. Doerr, R.: Centrbl. Bakt. Abt. T. Orig. XCVII, Beiheft 76. 1925-1926.
   idem. Zentrbl. f. Haut u. Geschlechtskr. XIII, XV, XVI. 1924.

After these three different experiments there can be no doubt that the myringitis bullosa has to be classified as a disease of the drum by itself, probably belonging to the group of herpes. But there was one important difference between the herpes reaction and that of myringitis bullosa on the rabbit cornea. Lipschuetz[9], Luger,[10] Lauda and others have demonstrated characteristic changes in the nuclei of the corneal epithelium of an herpetic infection. In the epithelium cells of all forms of herpes, both in man and experimentally infected animals, occur intranuclear inclusions which are acidophile, because they show a definite affinity to acid dyes, such as eosin, erythrosin and acid fuchsin.

Opinions about the meaning of these inclusions differ widely. While one claims them to be the reaction product of the virus itself, Provacek,[11] Lipschuetz,[12] Lindner,[13] Ullmann,[14] Luger and Lauda[15] believe them to be oxychromatic degenerations and none of the authors identify these with the virus itself.

It is not the purpose of this paper to go into details of this exceedingly interesting problem. In this respect I wish to refer to the excellent book on filterable virus by Rivers[16] which gives all the literature.

One experiment was still to be done, in order to show the relation of myringitis bullosa to the herpes group. We know from the work by Doerr that the rabbit cornea acquires immunity against a reinfection with the same virus. Although the above mentioned microscopic changes (intranuclear inclusions) were entirely absent in the myringitis bullosa keratitis, the so-called "crossed immunity experiment" was done (experiment 4).

After the symptoms of myringitis bullosa keratitis were all healed on a rabbit's eye, the same eye was reinfected with the same virus. In these cases no infection or infiltration of tissue could be produced. The traumatic lesions were gone after a few hours. We could conclude, therefor, that the virus produces an autoimmunity on the cornea. The same cornea, which showed immunity against reinfection with myringitis bullosa virus, was inoculated a few weeks later with a reliable authentically examined herpes virus, which we received by courtesy of Levaditi of the Pasteur Institute in Paris. The inoculation with herpes virus against myringitis bullosa immunized eyes was done in thirteen animals and was thirteen times positive.

After these experiments we could make the safe conclusion that, although the myringitis bullosa might be classified as a vesicular disease similar to the herpes group, it is by no means identical with it, as shown in experiments 2 and 3 (lack of intranuclear inclusions) and in experiment 4 (crossed immunity). With the knowledge of these facts concerning the etiologic experimental findings and the well defined clinical picture we may consider myringitis bullosa as a specific disease of the drum, caused by filterable virus.

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[9] Lipschuetz, B.: Arch. Dermat. u. Syph. Orig. CXXXVI. 1921.
idem. Centr. Bl. Bakt. Abt. Orig., XCIII and other places. 1924.

[10] Luger and Lauda: Wien. Klin. Wschr., XXXVIII, 33. 1925.
idem. Ergebnisse inn. Med. u Kinderkeilkunde. XXX, 377, 1926.

[11] Provacek, S.: Chlamydozoa Zusammenfassende Uebersicht Arch. f Protistenkunde, X, 336. 1907.

[12] Loco cit.

[13] Lindner, K.: Centr. Bl. Bakt. Abt. f Ref., 1 Beil. 23. 1911.

[14] Ullmann, E. V.: Loco cit. and Acta Oto-Lar, vol. 317. 1923-1924.

[15] Luger and Lauda: Med. Klinik, Berlin, XXII, 1926.

[16] Rivers, T. M.: Filtrable Virus, Williams & Wilkins Co., Baltimore. 1928.

HEAD INJURIES OF MODERATE DEGREE

A REVIEW OF ONE HUNDRED CASES, INCLUDING FIFTY VENTRICULAR STUDIES *

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One-third of all head injury cases seen in industrial surgery fall into a group of minor injuries. Perhaps there is some temporary loss of consciousness, but the patients are strong individuals and to them it is more or less trivial. As soon as the lacerations, if any, are healed, they are ready to resume their work. With these we have no further interest except to call attention to the fact that a strong, robust individual who receives a minor injury to his head, with no actual injury to the brain tissue, almost universally returns to work at the earliest possible moment.

On another side we have that group of patients who constitute perhaps another third of the sum total, that receive a perfectly obvious total permanent disability, which is so recognized by the attending physician and the Department of Labor and Industries. This group of cases does not interest us in the present discussion.

The remaining third is that group of patients who, after a period of time, do not adjust themselves to their present condition. The factors involved in

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* From Neurosurgical Clinic.

this failure of readjustment are, of course, first of all the injury itself. The more severe the injury without total disability, the more easy it is to observe physical findings which will correspond to the subjective symptoms. This, one might say, would constitute the upper margin of disability in this particular group, while the true malingerer, the man who feels that the state owes him a living and uses a head injury merely as a subterfuge, would be found at the other end of the list. A great many cases are found between these two extremes and the factors which might be noted as contributing somewhat to their inability of readjustment are suggestion on the part of the doctor, the relatives or other patients, particularly those suffering from a similar injury, perhaps of a more severe degree. An unstable or nervous temperament almost universally leads to failure of readjustment, even though the injury may be very slight. Lastly, repeated injuries of the same character to the same individal, each causing a more lasting impression upon his mental processes.

It is this group of cases which causes the greatest difficulty both to the state Department of Labor and Industries in arriving at a just compensation and to insurance companies in estimating the amount of compensable disability, and to the physicians who are called upon to make these estimations and evaluations. The Department of Labor and Industries is not to be classed exactly as the casualty insurance company because it is not only authorized by law to make suitable compensation but also to reinsure the patient repeatedly. Insurance companies, on the other hand, have only to deal with one injury and that solely on a strictly monetary basis. What happens to the man afterward is no concern of the insurance company. The problem of the physician lies in an attempt to be fair to both parties and to see that no injustice is done on either side.

With these facts in mind, a study has been made of one hundred cases falling in this last group, that is, those who have suffered injuries to the head and have not been able to readjust themselves to the conditions found following the injuries. In this are included fifty ventricular studies, used as a check on the general physical examination. These examinations were all made at the request of the Department of Labor and Industries and wherever there was a reasonable doubt that there was actually a physical lesion which could be the cause of the failure to readjustment, a ventricular study was done.

In the examination the following points were noted: the patient's age, date of injury, character of the injury as to consciousness or unconsciousness, time in hospital, time elapsing between the injury and the examination, the time the patient was out of work, the subjective symptoms, the cranial nerve examination, the general neurologic examination and the ventricular study. The ventricular studies included the pressure of the cerebrospinal fluid, the cell count, the character of the fluid, the Wassermann test, the roentgenogram showing changes in the size, shape or position of the ventricles and the presence of air over the cortex. The following tables will give a resume of the findings in each of these instances (Tables I and II).

TABLE I

SUMMARY OF 100 CASES

Average age, 42 years.
Average time between the injury and examination, 8 months.
Number who have worked at any time since injury, 24.
Number who have not worked since injury, 76.
Chief complaints:

1. Headache	78
2. Dizziness	61
3. Loss of hearing	29
4. Loss of vision	27
5. Localized pain	27
6. General weakness	25
7. Loss of memory	13
8. Sensory disturbances	3

Positive findings:
Cranial Nerves

I	Loss of Smell	3	
II	Edema	36	
	Atrophy	7	
	Arteriosclerosis	4	
III	Ptosis	7	
	External strabismus	1	
VI	Internal strabismus	1	
VII	Paralysis	left 1	right 3
VIII	Tinnitus	4	
	Nerve Deafness	left 7	right 9
	Nystagmus	5	

Incoordination, 14.
Reflexes: Deep, increased 23; decreased, 8.
Superficial, increased, 7.
Babinski, positive, 6.

TABLE II

SUMMARY OF 50 VENTRICULAR STUDIES

Cerebrospinal fluid pressure. Average 28.5 mm.
Color, clear, 48; amber, 2.
Cells, average, 4.
Wassermann reaction, negative, 46; positive, 4.
Sugar, average, 59 mgm.
Roentgenograms:

Displacement, bilateral to the left	2
Dilatation of the ventricles	4
Compression of the ventricles	4
Air over cortex of frontal lobes	13
Practically normal shadows	27

Fractures. Total, 12.

Depressed	5
Linear	2
Stellate	4
Left parietal exostosis	1

While headaches are the most frequent complaint, they are very difficult to prove. Dizziness, while not as frequently noted as headache, should in a large number of cases be associated with positive physical findings, such as nystagmus and loss of hearing. Localized pain is difficult of proof and occurs quite frequently. This was differentiated from generalized headache. Disturbances of vision and hearing could be checked by careful testing, which was done in most instances. General weakness could be more or less corroborated but this also is difficult to prove, unless it is present to a marked degree. The temperament of the individual patient plays an important part in the evaluation placed upon symptoms by the examining physician.

In the examination of the cranial nerves, the most striking findings are passive edema which manifests itself either by congestion of the vessels or a true swelling of the nerve head. Other changes in the cranial nerves were not of sufficient frequency to be considered. The changes in the deep and superficial reflexes were not particularly marked, increased reflexes being present in approximately twenty-five per cent of all cases.

The average age of the patients was forty-two and the average time between the injury and our examination was eight months. Only twelve of the one hundred cases showed positive fractures in the roentgenograms which were taken. We have, then, a composite picture of a man approximately forty-two years of age, who eight months prior to our examination had suffered an injury to the head which had caused subjective symptoms, as severe headache, dizziness, general weakness, disturbances in hearing and vision, loss of memory and localized pain, who presented practically no neurologic findings except increased reflexes and passive congestion of the vessels of the retina. In only twelve per cent of cases did roentgenograms show fracture of the skull, yet this average individual has been unable to adjust himself to his surroundings.

The records of the state show that in a total of fifty cases, the time loss was 695 months and 16 days, or an average per case of 13 months and 27 days of total time lost. Of thirty-five cases, there is a total permanent partial disability of 954.12 degrees, or an average of 27.26 degrees disability. Estimating the disability at $30.00 per degree, this would mean that the average person receiving a head injury costs the state, in addition to his treatment, the sum of $817.80 for permanent partial disability (Table III).

TABLE III

ECONOMIC SUMMARY

Time loss, 50 cases. Total, 695 months 16 days.
Average, 13 months 27 days.
Permanent partial disability, 35 cases.
Total, 954.12 degrees.
Average, 27.26 degrees.
Cases on time loss, no particular treatment, 11.
Cases still receiving treatment, 2.

In an effort to ascertain whether or not there is an actual physical disability in the majority of these cases, ventricular studies were done on those, where there was any question as to the presence of such a lesion. Penfield,[1] in a report on a series of traumatic cases, emphasized the fact that there was accumulation of cerebrospinal fluid, local in character, which responded after insufflation of air. Fay[2] later corroborated these findings and also added his observation of the general distribution of air over the frontal areas of the brain in traumatic lesions. In all cases we have been able to demonstrate this localized accumulation of air and also the general distribution of air as suggested by him.

The examinations were all done in the upright position and the average cerebrospinal fluid pressure in the fifty cases was 28.5 millimeters of mercury. If we consider 20 millimeters as the highest normal cerebrospinal fluid pressure, it is apparent that an increased pressure is present in traumatic cases. The average cell count in these cases was seven but this included four positive Wassermanns with high cell counts. If we exclude the four positive Wassermanns, the average cell count is four, which perhaps is the upper limit for normal. Some authorities claim that anything above two cells is abnormal.

The estimation of the sugar content in the cerebrospinal fluid shows an average of 59 milligrams, which is well within the normal range. In the tabulation of the roentgenograms, showing displacement of the ventricles, we find bilateral displacement in two cases, dilatation of the ventricles in four and compression of the ventricles in four. In thirteen cases, or twenty-six per cent, air showed over the cortex. The amount of air injected varied from 25 to 40 c.c. Undoubtedly, if 100 c.c. of air had been used, we may have found more cases, but any marked degree of cerebral atrophy will be easily demonstrated by use of 25 to 40 c.c. of air, so we feel that these figures are quite accurate.

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[1] Penfield, W. G.: Cerebral Pressure Atrophy, presented before the Assoc. for Research in Nervous and Mental Disease, Dec. 28, 1927.

[2] Fay, Temple (1925 b). Treatment of Cerebral Trauma, W. Va. Med. J., 20:281-288, June, 1925.

Ibid. (1929 a). Some Factors in Mechanical Theory of Epilepsy, with Especial Reference to Influence of Fluid and Its Control in Treatment of Certain Cases. Am. J. Psychiat., 8:783-835, March, 1929.

Ibid. (1930 a). Generalized Pressure Atrophy of the Brain, Secondary to Traumatic and Pathologic Involvement of Pacchionian Bodies. J. A. M. A., 94:245-249, January 25, 1930.

Fay, Temple and Winkelman, N. W.: (1930 b). Widespread Pressure Atrophy of the Brain, and Its Probable Relation to the Function of the Pacchionian Bodies, and the Cerebrospinal Fluid Circulation. Am. J. Psychiat., 9:667-686, January, 1930.

In glancing at the subjective symptoms, we find disturbance of hearing, disturbance of vision, localized pain and general weakness in about the same percentage of cases as we find distribution of air over the cortex. Practically all of the cases showing air over the cortex complained of these symptoms. There does not seem to be any relation between the degree of headache and dizziness and the ventricular findings of air over the cortex or disturbance in the ventricular system. As practically all of the patients on whom a ventricular study was made complained of both headache and dizziness and only twenty-five per cent showed cortical air, it is fair to assume that only one in four actually are suffering from severe headache and dizziness.

This brings us, then, to the discussion of the relative value of the history of the patient, physical examination and the ventricular study in these cases. Obviously the history, while important if combined with the patient's statement as to symptoms, is of value in only twenty-five per cent of the cases. Nor does the physical examination yield much more information. The ventricular study is more accurate and gives positive findings. Particularly is this true in the case of a general edema and it also suggests the treatment which is of greatest benefit to these patients, namely, dehydration followed by limitation of fluid intake.

It is not going to be possible to secure ventricular studies on all questionable cases, nor will it be possible to estimate exactly the degree of compensable injury, but it will be possible for the medical profession to give better treatment at the very beginning of the injury. This, no doubt, will do away with many actual disabilities. It will not help those cases in which there is a tear of the arachnoid with accumulation of cerebrospinal fluid about the cortex, as first noted by Naffziger.[3] Secondly, we must look forward to the time when all those engaged in active industry shall have to submit to a physical examination and have the actual condition present at the time of securing the position noted. An injury subsequent to this examination can be checked by the previous physical condition of the patient. Lastly, there must be in industry, just as there is in our colleges today and in the business world, a reclassification from the standpoint of temperament and adaptibility.

Men who are constitutionally psychopathic to begin with cannot be permitted to enter the hazardous occupations, where the slightest injury will bring about claims for complete and total disability. Perhaps this is looking far into the future but already large companies, such as the Standard Oil Company, for instance, the United States Steel Corporation and even many of the chain stores, are insisting upon physical examinations at the time of employment and rejecting all those whose temperament unfits them for positions of a certain nature. Industry must either assume a tremendous burden which will include these temperamentally unfit as well as the malingerers in the final summing up of their compensable cases, or else must exclude these prior to an injury.

A NEW TECHNIC IN ADENOIDECTOMY*

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The frequent pharyngoscopic picture of remnants of adenoid tissue, so constantly associated with chronic catarrhal conditions and particularly with obstinate ear cases, are responsible for my becoming interested in the subject which I am bringing before you at this time. These remnants are sometimes in irregular nodules, which may indicate that the adenoid tissue had been left in a ragged condition. At other times there may be one and often two remaining strips on either side for the full length of the adenoid field. Who of us has not had many patients, adults as well as children, in whom pharyngoscopic examination reveals evidence of an incomplete adenoidectomy?

We find in the older texts that authors advise the removal of adenoids with spoons fashioned for that purpose or forceps with somewhat dulled edges or even with the finger nail. Fibrous tumors originating in the pharyngeal vault were more common in those days, and, I believe, came from the adenoid tissue being mangled and traumatized, when there should have been removal of the entire mass by a clean cut. Remnants were stimulated to grow by the frequent effort of the patient to clear the postnasal space by suction, prompted by the sense of irritation which occurs when remnants are left.

Since it is the purpose of this paper to discuss the technic in adenoidectomy, a brief consideration of the anatomy of the adenoid is essential. Omitting the usual textbook description of the location and general anatomy of the adenoid, I will call to your attention only certain anatomic details which bear directly upon the surgery of the organ. The pharyngeal tonsil, or adenoid, is a lobulated mass of lymphoid tissue, with the swellings usually regularly arranged about or lateral to a central depression, so that the adenoid often resembles the kernel of a walnut. The central depression may or may not extend completely through the adenoid mass. The fact that it does sometimes extend through and is seen perforating the pharyngeal tonsil after its removal is probably responsible for some confusion which has existed in considering this to be a part of the bursa pharyngea, which it is not. The fact that the adenoid varies in size, shape and density, and is located on a surface that varies much in contour, are items of much importance, as well as the fact that the field of operation is not visible. It may be a well defined, rounded mass confined to the middle of the posterosuperior wall of the pharynx, or it may be very much more diffuse. Lateral extensions into the folds just posterior to the eustachian tubal eminences or well into the fossa of Rosenmueller, are not at all uncommon and when present, of course, demand accurate removal, perhaps more than any other portion of the organ. There may also be considerable extension downward on the posterior pharyngeal wall, so that the adenoid may seem to continue down into the lymphoid masses studding the posterior wall of the oropharynx. Careful examination, however, will show a fairly definite inferior margin, where the pharyngeal tonsil itself stops and which should limit the field of operation.

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[3] Naffziger, Howard C.: Subdural Fluid Accumulations Following Head Injury. J. A. M. A., 82:1751-1752, May 31, 1924.

* Read before the Pan-Pacific Surgical Conference, Honolulu, Hawaii, Aug. 14-24, 1929.

The pharyngeal tonsil is not definitely encapsulated as are the faucial tonsils, although its anatomic relation to the underlying musculature is seen on section to be rather similar. The adenoid mass lies upon the pharyngeal aponeurosis covering the superior constrictor muscle, this aponeurosis being a compact sheet of fibrous tissue. Between the pharyngeal aponeurosis and the adenoid mass is found a fairly definite area of rather loose connective tissue, fibers of which extend upward through the adenoid to form trabeculae. This fibrous tissue, however, does not limit the glandular tissue of the adenoid strictly, as lymph nodules may be found scattered at various levels. The plane of section in removal of the adenoid is, as nearly as possible, just superficial to the pharyngeal aponeurosis through the looser area of connective tissue, bearing in mind that the lack of a definite limiting capsular structure makes enucleation of the adenoid impossible, as the faucial tonsil is enucleated.

A great number of instruments have been devised for the purpose of performing the operation of adenoidectomy. These fall into three main groups, namely, forceps, adenotomes and curettes. It is not within the scope of this paper to consider the individual instruments in detail as there are as many as ten or twenty in some of the groups, but I will discuss each of the three groups as a whole with some mention of individual instruments. Adenoid cutting forceps have been designed with varying curves to fit the postnasal space, with sharp edges and dull edges and overlapping jaws. Since their biting motion must of necessity be from side to side, they are ill adapted to removal of adenoid tissue from the lateral folds, and removal of the main mass must be done piecemeal, making a clean operation extremely difficult if not impossible. According to my observation, these instruments are used very little at the present time and in my opinion are far less efficient than either the adenotome or the curette.

The adenotome in most common use is the La Force instrument or one of its modifications, Bane's and Stevenson's being probably the most popular. A more recent type of instrument which deserves mention is the Kelley direct vision adenotome, which, as its name implies, is designed with the intention of pushing forward the soft palate and giving the operator a view of the adenoid mass through the instrument. It is my opinion that the adenotomes, while safe, are not thorough, for they cannot be fitted with accuracy and with a good degree of effectiveness into the nasopharyngeal space with its anatomic variations. The sides of the box are of sufficient thickness to prevent the removal of adenoid tissue close up against the lateral pharyngeal wall. The curve of the bottom of the box does not necessarily follow the curve of the posterior pharyngeal wall, so that too deep a cut might be made in one place, or, what is much more likely, a considerable mass or masses of adenoid tissue left. The instruments are so expensive that it is not practical to manufacture them in a sufficient number of sizes and widths, as few doctors buy more than one or two sizes.

Of the numbers of curettes which have been devised, variations occur in the angle of the blade, shape and size of fenestrum, and angle of shank.

while several have been constructed with boxes to catch the adenoid mass and prevent it being lost in the throat. The Beckman and the Kaplan modified Beckman, the Gottstein, Barnhill and Vogel are the curettes most commonly seen in use.

In describing my own method for performing the operation of adenoidectomy I shall consider the subject in two divisions; first, the selection of instruments and, second, the technic of the operation.

Any fenestrated curette may be used, if so constructed that it can be easily fitted into the adenoid space and conforms to the following specifications: (1) It should have the largest possible fenestrum, through which the adenoid is to be pressed. To have this the wings must have the least possible lateral width, obtaining their needed strength in the vertical dimensions. (2) The blade must have the least possible anteroposterior dimension consistent with the required strength. (3) The cutting edge of the blade must be kept reasonably sharp. (4) The curve from the shank to the blade is important in giving the blade the correct angle; this must vary, depending on the depth and angle of the pharyngeal vault. (5) The size of the curette used in the individual case must be determined after careful measurement between lips of eustachian tubes. This should be the widest instrument that can be fitted into the space without trauma.

It is readily understood that a goodly number of curettes are needed to meet the needs of the operator, not only in the usual but particularly in the unusual cases. He must have the proper angle of blade and the widest instrument that can be fitted into the space, so that all the adenoid mass will be pressed into the fenestrum without trauma, leaving no remnants on the sides.

My technic, after the adenoid is thrust through the fenestrum of an instrument of the above requirements, differs widely from the direct downward sweep which, according to textbooks, is customarily used. It is my contention that it is impossible, with a straight downward motion of the blade, either to follow accurately the base of the adenoid mass or to sever it with a clean cut. The idea first came to me after watching my wife cut a loaf of light bread fresh from the oven. Of course, it was very soft and in that respect resembled some adenoid masses in its consistency. As she cut slice after slice from that soft loaf with slight to and fro movements of the knife and left a perfectly smooth surface, a comparison between her procedure and the adenoid operation came to me. It was quite apparent that a direct downward pressure of the knife would not satisfactorily cut the loaf of bread but mash it, and I determined to make experiments to improve my technic in adenoidectomy.

I found that it was quite possible to impart to the blade of the adenoid curette a definite lateral motion and with this the adenoid could be severed from its base cleanly and with the use of very little pressure, thereby permitting greatly increased delicacy of touch with the instrument and allowing the operator to guide it with accuracy along anatomic lines. To execute this movement, the handle of the curette is grasped as though it were to be used as a pen, this being just opposite to the position ordinarily assumed. The instrument is inserted into the nasopharynx and is carried forward until the front of the blade strikes the posterior edge of the septum. The fitting of the curette over the adenoid mass and against the posterior pharyngeal wall is of great importance, and may be done with great exactitude by the sense of touch. The lateral movement of the blade is then obtained by a rhythmic rotary motion of the thumb, fingers and wrist, and at the same time the curette is drawn downward through the adenoid mass. With a sharp blade, it will be found that the cut is made almost without effort and with some practice a very accurate knowledge of the exact position of the blade at all times is obtained by the sense of touch. The instrument will cut cleanly through the inferior edge of the adenoid mass without danger of stripping the mucous membrane from the posterior wall of the pharynx.

In conclusion I wish to state that it is my opinion there have been and are still being done many incomplete adenoidectomies. I feel that the very commonness and apparent simplicity of the operation has prevented its receiving the attention it deserves. With the properly selected instrument and the use of the technic as outlined above I am certain that a greatly improved surgical procedure can be obtained.

Tumors of the Eye and Adnexa. E. H. Cary, Dallas Texas (*Journal A.M.A.*, Dec. 13, 1930), reports twenty-two cases of tumor including teleplasms from mesoblasts, teleplasms derived from neural epiblasts, teleplasms arising in parts, derived from masoblasts, teleplasms derived from cuticular epiblasts, optic nerve tumors, mesoblastic tumors; orbital sacromas, a xanthosarcoma or liposarcoma, an orbital tumor of the gland type and an orbital cyst. He emphasized the value of injecting an eye specimen with solution of formaldehyde, as it aids materially in the clinician's macroscopic study of the eye without preventing further examination miscroscopically. The procedure of tying and incising all the branches of the external carotid on each side seems definitely to have delayed the death of several of the patients in whom it was used.

SEPARATION OF THE UPPER FEMORAL EPIPHYSIS

SUMMARY OF TEN CASES*

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Separation of the upper femoral epiphysis, while it is a rather infrequent condition, is common enough to merit drawing our attention to it. In the last two years we have seen nine cases with complete or partial separation of the upper femoral epiphysis, and one case which well illustrates what the final outcome is in a case which has not been treated. This paper is more or less of a study made of these ten cases. It is hoped that from this series, although small, we may be able to evaluate in particular the type of treatment which should be used in handling a case of this kind (chart 1).

It is evident that separation of the epiphysis can occur only before the time of closure of the epiphyseal line. After its closure the upper femoral epiphysis becomes an integral part with the neck and shaft of the femur, and any trauma which could produce a slipping or separation of the epiphysis would probably produce a fracture of the neck of the femur or a dislocation of the hip.

Practically all of these cases occur during the period of adolescence and, therefore, this condition of partial or complete separation of the upper femoral epiphysis is also designated, "coxa vara of adolescence" (chart 2).

ETIOLOGY

Two types of cases are generally encountered in this type of lesion: (a) the markedly overweight girl or boy with definite signs of glandular derangements, (b) the slender, rapidly growing, and probably slightly overweight child.

Two cases in this series had the rather typical findings of the so-called "Fröhlich's syndrome." Al the others had grown rather rapidly in the last few years before the onset of the trouble. Some showed some excess weight as compared to the normal.

Trauma undoubtedly is a definite factor in causing displacement. Four of the cases gave histories of having had injuries severe enough to cause a slip or separation. If we study the articular mechanism of the hip, it is easy to understand how trauma can produce this lesion. Normally, extension of the hip is possible from 15° to 20°. Beyond this point further extension is blocked by the tightening of the capsule and strong anterior ligaments of the hip joint, and also by the fact that the head of the femur becomes securely locked in the acetabulum. Therefore, upon forcible hyperextension beyond the normal limits, further motion must occur in the epiphyseal line, and the head of the femur is slipped off the neck or is partially separated.

Probably the reason that more cases do not occur before the adolescent age is because in younger children the periosteum of the neck of the femur is thick and strong and is a big factor in holding the epiphysis in place, but as adolescent age is approached this thick layer of periosteum begins to atrophy, and, therefore, the epiphysis is more vulnerable to trauma.

Another factor which may have a bearing on the etiology of this lesion is that, as adolescence is approached, the epihysis assumes a more vertical relationship to the neck of the femur. In younger children the epiphysis is situated in almost a transverse plane, so that weight bearing could not be a factor in causing displacement. But in adolescence, the epiphysis being in a much more vertical position, it is evident that any slight trauma which might increase the vascularity and consequent softening of the epiphyseal line cartilage, might cause a slipping because of weight-bearing stresses.

In the endocrine cases there may be a disturbance in the epiphyseal cartilage, in which there occurs a softening, and slipping might occur because of weight-bearing stresses. Blood chemistry studies, however, show no abnormal findings.

PATHOLOGY

Some specimens of this lesion have been examined by other investigators. They report that the epiphyseal line is broadened and there is increased vascularity. Microscopic sections show that the cartilage cells have lost their orderly arrangement in columns and are scattered irregularly through the matrix. So far, pathologic studies have not aided a great deal to determine the definite etiologic factor in these cases.

SYMPTOMS AND CLINICAL FINDINGS

In cases of complete separation all the findings are identical to those in case of a fracture of the femur. Cases of complete separation always have a history of definite and rather severe trauma, followed by immediate disability.

In cases of incomplete separation the child comes

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* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

CHART 1

Case Sex Age	Entrance	Hip	Obesity	Frolichs	Trauma	Treatment	Duration of Symptoms	Result
1. C. H. ♂ 15	April-1929	Left	Slight	No	No	Open reduction	10 months	Poor. Ankylosis of hip, in good position.
2. J. F. T. ♂ 39	April-1928	Left	Yes	Yes	Pain in hip since adolescence	Arthrodesis of hip	Many years	Good. Painless hip in good position.
3. V. R. ♀ 11	Oct.-1928	Left	Slight. Rapid Growth.	No	No	Open reduction	2 months	Poor. Ankylosis of hip. Good position.
4. P. C. ♂ 11	Oct.-1928 and April-1930	Right	Yes	Yes	Not definite	Traction and cast	5 months	Good. Some limitation, flexion and internal rotation.
5. B. W. ♂ 16	May-1929	Left	Yes, and Rapid Growth.	No	No	None	1 year	Advised reconstruction operation.
6. E. A. ♂ 13	June-1929	Right	No	No	Yes, kicked by a cow	Whitman manipulation	3 days	Good. Almost normal range of motion.
7. D. C. ♂ 12	Sept.-1929	Left	No	No	Yes. Fall with hip going in hyper-extension	Whitman manipulation	4 weeks	Poor. Ankylosis of hip in good position.
8. M. N. ♀ 11	Oct.-1929	Left	Yes	No	Yes	Whitman manipulation	Onset of symptoms: 1 month. Acute symptoms after definite trauma on day of admission.	Good. Almost normal range of motion.
9. D. D. ♂ 15	Dec.-1929	Left	No. Rapid Growth.	No	Yes. While wrestling was forcibly thrown	Traction and cast	Had pain in hip 2 weeks before onset of acute symptoms.	Excellent. Normal range of motion.
10. E. S. ♂ 12	May-1930	Left	No	No	No	Traction and cast	3 months	Excellent. Normal range of motion.

♂ = Male
♀ = Female

CHART 2

Cases with Partial or Complete Separation

Cases seen	9
Cases healed	8
Excellent	2 or 25.0%
Good	3 or 37.5%
Poor	3 or 37.5%

Results as to Type of Treatment

A. Traction and cast (2).	
Excellent	1
Good	1
B. Manipulation and cast (3).	
Good	2
Poor (ankylosis of hip)	1
C. Traction alone, 1 case with excellent result.	
D. Open reduction (2).	
Poor (ankylosis of hip)	2

in complaining, as a rule, of rheumatism in the hip; there may also be referred pain to the knee joint. Sometimes there is a history of trauma which may be quite mild. This may be followed by a limp, but not sufficient pain to keep the child from weight bearing. Then there may be additional trauma and the symptoms become much more marked. On examination the affected hip will be found in a more or less degree of abduction and external rotation. Abduction, internal rotation and flexion are more or less limited. There may be some muscle spasm, depending on the severity of the symptoms present.

The radiographic findings are entirely characteristic, there being a definite malrelationship of the epiphysis with the neck of the femur. The radiographic findings are so definite that one can hardly confuse this lesion with that of osteochondritis juvenilis, tuberculosis or arthritis of the hip.

TREATMENT

The type of treatment to be used in a given case must necessarily be somewhat dependent upon the type of separation which is present and the length of time that the displacement has existed. In cases in which there has been acute trauma and a complete or incomplete separation is found to be present, we believe it is proper to give the child an anesthetic and place the hip in the Whitman abducted position. We believe this is particularly indicated in the cases which show complete separation. Those cases showing a partial slipping can very nicely be treated by means of traction until the deformity is entirely overcome, and then a plaster support with the affected limb in the Whitman abducted position is applied.

However, cases of partial separation, in which it is determined that the condition has been present for more than three or four weeks, should not be manipulated forcibly under anesthesia and then placed in a plaster support in the Whitman abducted position. Forcible manipulation is too apt to cause the formation of adhesions in the joint and the end-result is an ankylosis of the hip.

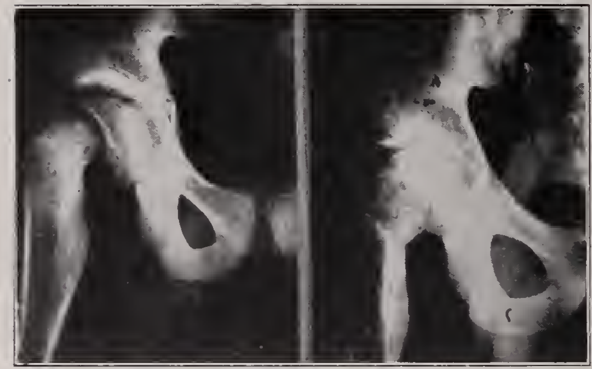
A B

Fig. 1. Case 6. Acute separation. A, before Whitman manipulation. B, end result. Good range of motion.

In our series, three cases were treated by this method of manipulation and then a plaster support applied with the limb in the Whitman abducted position. Two of these had a complete separation and of just a few days' duration. Both of these recovered with almost a normal range of motion in the hip joint (fig. 1).

However, the third case had quite a marked slipping, almost a complete separation which had been present for one month. This patient was manipulated under anesthesia and a good anatomic reduction was obtained. A plaster support with the limb in the abducted position was applied. However, this patient ended with an ankylosed hip which must have been caused by the fact that the manipulation stirred up quite a reaction about the hip joint and intraarticular adhesions formed.

Therefore, in cases in which it is not definite if quite firm union is present, and there is malunion, the safer plan is to apply traction and attempt to correct the deformity. By so doing there is no danger of obtaining an ankylosis, nor of losing the range of motion which was present in the hip joint before the treatment was started.

In this series two cases were treated by traction until good reposition of the epiphysis was obtained, and then a plaster support in the Whitman abducted position applied. The one case had had the lesion for five months. A good result was obtained with a good range of motion in the hip joint. However, this boy was definitely of the glandular type, and was overweight, and soon after he began bearing weight he again had a slipping. Traction only was then applied for about four weeks, followed by a caliper walking splint. He now has a good range of motion in the hip joint, but still shows a slight coxa vara. It is quite unusual that reduction could be obtained in this case by means of traction, even when the condition had been present for five months before treatment was instituted. But the fact that this boy was of the glandular type might explain the fact that reduction was obtained.

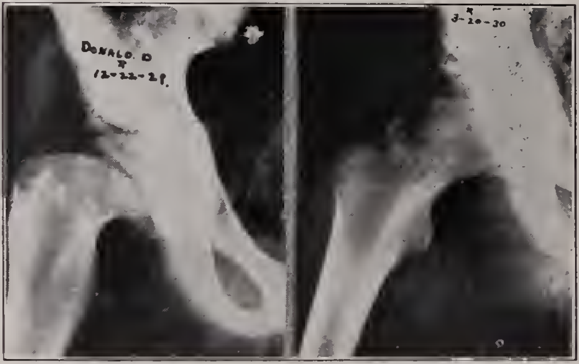

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Fig. 2. A. D. D., case 9. Acute slipping. A, before traction was instituted. B, end-result, following traction and plaster support. Result is excellent.

The other case had a partial separation which was but of a few days' duration. It was decided to attempt traction, and a perfect anatomic reduction was obtained (fig. 2). This patient has a full normal range of motion in the hip joint.

Another case was treated by means of traction alone for a period of six weeks, followed by a walking caliper brace. A very excellent functional and

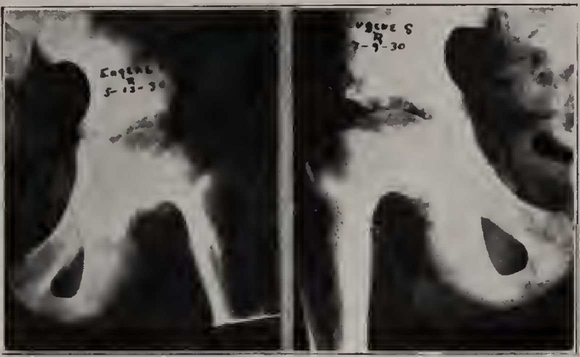

Fig. 3. E. S., case 10. Duration of symptoms three months. A, before treatment. B, after traction alone. End-result is excellent.

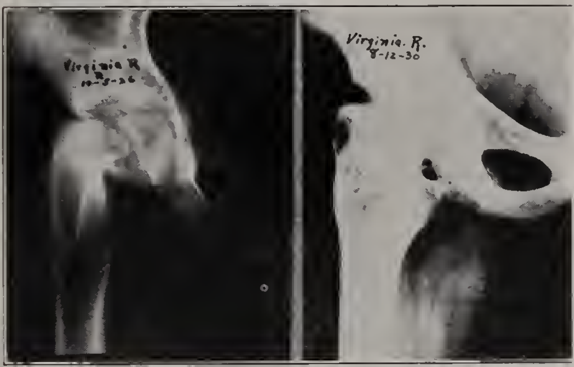

Fig. 4. V. R., case 3. A, before open reduction. B, good antomic reduction but hip is ankylosed.

anatomic result was obtained (fig. 3). This patient had had the lesion for three months before treatment was instituted.

The traction is applied in the following manner. Generally fifteen to twenty pounds extension is applied to both lower extremities. The unaffected side is swung out into extreme abduction as rapidly as possible. This helps to stabilize the pelvis. On the affected side a Thomas splint is securely fastened to the limb by means of moleskin adhesive. Then ropes are attached to the inner bar of the Thomas splint, are passed beneath the limb and splint, and then through pulleys on the overhead frame of the bed. By this means very effective internal rotation can be produced. On the affected side extension is first made in the straight line for a few days, and then abduction is gradually increased every day until the extreme abducted and the extreme internally rotated position is obtained.

Cases which do not respond to this should not be subjected to a manipulation because to do so may end in an ankylosis. It is better in these to preserve the motion which is present in the hip and simply do a subtrochanteric osteotomy, remove a wedge of bone with the base outward so as to give more range of abduction, and internally rotate the limb to correct the external rotation deformity which is present.

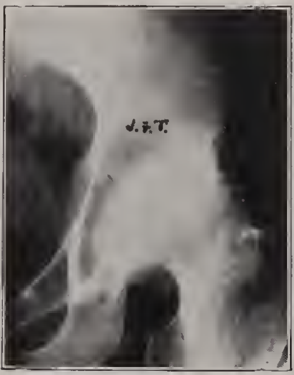

Fig. 5 J. F. T., case 2. Appearance of hip before a throdesis. Painful limited motion and deformity.

Some men have advised doing an open reduction in cases in which there is partial union in a malposition. Two cases in this series were subjected to the open operation. A good anatomic reduction was obtained in both cases, but there also resulted a complete ankylosis of the hip in both cases (fig. 4). The experience of others is similar to ours, and obviously open reduction is very much to be feared.

Then there are those cases in which there is painful and markedly limited motion in the affected hip, and probably associated external rotation, flexion and adduction deformity. These frequently are seen in older individuals from thirty-six years and older. The affected hip will show marked narrowing of the joint space, enlargement of the head of the femur and changes of the nature of an osteoarthritis. These are undoubtedly due to slipped epiphyses in adolescence or probably the resultant of a Perthe's disease of the hip.

One case (fig. 5) in our series had all the findings as described. An arthrodesis of the hip was performed and the hip placed in a good functional position. He now has a painless hip, in good position, and gets along very nicely.

In other cases, in which it is imperative that motion be obtained, an arthroplasty of a Whitman reconstruction operation can be advised.

REACTION OF CONTENT OF GASTROINTESTINAL TRACT. Frank C. Mann and Jesse L. Bollman, Rochester, Minn. (*Journal A.M.A.*, Dec. 6, 1930), have developed a method for repeatedly securing, under normal physiologic conditions, specimens of the gastrointestinal content at various levels of the tract. Estimation of the acidity in the fasting animal showed that the gastric juices are usually strongly acid, pH 1.5 to 2.0, but may be at times almost neutral. The content of the duodenum, jejumum, ileum and colon is usually found to be alkaline, pH 7.0 to 8.0, with the exception that the content of the duodenum may be found to be acid when highly acid values are found in the content of the stomach. Following a meal, the acidity of the content of the gastrointestinal tract depends largely on the development of acid in the stomach. Short periods of high acidity of content are common in the duodenum and less common in the small intestine, the greater the distance from the pylorus.

THE HENDON KEY

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There will always be a difference of opinion as to open or closed methods of treating fractures, as the most radical experiments of each school will naturally overlap in the middle when fair apposition is attainable. We have inherited a fear of the bone marrow that it is intolerant of interference and that fatty embolism is a very real danger. Granting this, we must admit that these disasters are very seldom mentioned in any large series of open work on fractured bones, either recent or old. The crux of the argument, for or against direct fixation, is disability time and future function. In civil practice deaths appear to be rare.

The site of injury will always have a bearing on the treatment. One hundred per cent of acromioclavicular dislocations, patellar and olecranon fractures will be opened by most men and the results will be much appreciated by the patients. That results in long bone fracture are better than they were a few decades ago all will admit, who remember the number of cripples who were practically helpless.

When talking to a surgeon, who has supervision of the industrial injuries of our state, he made the statement that almost all bone plates were removed for cause, that the results were disastrous, and that the Commission was much opposed to open reduction. This started my looking up the open work I had seen and I found that acromical, olecranon and patellar fractures had no troubles; that long bones opened had given all degrees of infection and, while all had healed eventually, the functional results were relatively poor.

I came to two conclusions. One was that the first three classes of bones fulfilled the surgical aphorism of being direct and complete. These bones were united by their soft tissues mostly with absorbable sutures, were closed tightly, no cast or pressure fixation applied and gave no trouble. The others were united usually by the Lane hinge which is not adequate fixation. A cast, Buck's extension or other method must be applied which means a constant insult to the soft tissues and circulatory disturbance.

Someone said years ago that the joints above and below a long bone fracture must be immobilized. We politely defer to precedent and copy this into our textbooks, but it is purely a matter of mechanics. What structural engineer would repair a broken girder other than by welding the break. Here, in the bone, we have much more need of complete local fixation, as the wobbling ends constantly injure the tissues, set up little hemorrhages, and delay union. It has well been said that, when we do a permanent fixation at once, we treat the fracture; when we do this later on, we treat the complications. The numerical argument that comes up, saying most men dealing with fractures are satisfied with their present results, is not conclusive.

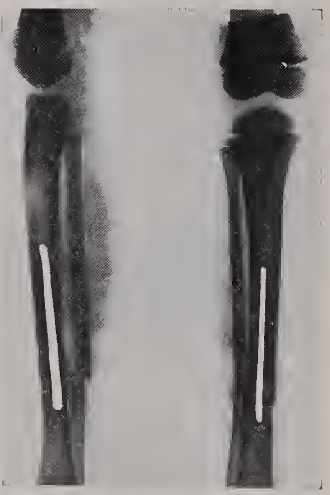

Fig. 1. Roentgenogram of leg one week after injury, showing bone peg retouched and enlarged.

We remember that about fifteen years ago Russell pointed out the fallacy of the tongs applied to the condyles in lower femur fractures, when all the shortening pull is exerted through muscles attached to the head of the tibia; and how little this was regarded until the recent work and visit of Böhler, whose pin through the tuberosity of the tibia is much more logical.

Two years ago at Portland, Dr. Hendon of Louisville showed a square cut bone key, about three-eighths of an inch on the flat and four to five inches long, that he had used as a direct complete fixation. He uses no other mode to restrain the patient and it is an extremely simple method. Like many others at the time I was much impressed. I got some of the keys and forget all about them. I have had the usual troubles with the closed extension methods, pain from skeletal traction, occasional infections and necrosed areas of bone, loose casts, not any too good reduction three weeks after a perfect roentgenogram, bedsores, some nonunion that meant plating, and finally a joint that was never normal either above or below the break, nothing to cause conceit, while the patellar cases opened at once gave no more trouble than an appendectomy. Care of a fracture is the care of the soft tissues and these cannot be protected, while two jagged bone ends wobble about as the muscles pull them.

Case 1. September 7, 1930, a boy of seven was brought to the hospital late in the evening with a compound fracture of tibia and fibula, three inches above the ankle. Auto accident. The soft tissues were in good condition, and I decided to try a key.

With careful debridement we everted the lower end of the tibia and introduced the key into the medullary cavity, hammering it in snugly until about one inch of the key protruded. The other end of the tibia was cleared of soft structures and the key entered into the upper medullary canal and the bone snapped together. Meshing all the small indentations perfectly, we closed this tightly with silkworm gut, put on an ordinary dressing and the child was in bed in thirty minutes. There was no shock. He was given tetanus antitoxin as a routine. He had no after pain. Stitches were out the twelfth day and he left the hospital the seventeenth day. I am sure that he walked from seven weeks on (fig. 1).

Dr. Hendon has good grounds for absolutely keeping catgut out of these incisions. The opening can be made in a blood-free area and small bleeders pinched off; then deep silkworm gut stitches can control most of the area. Casts, Buck's extension, skeletal traction are looked upon as interfering with circulation and repair, conducive to small emboli and infection. The normal muscle pull on a perfectly reduced long bone fracture tends to be equal and, while the patient is at rest, the alignment will be good and painless. The key prevents slipping off or buckling and this meat bone key, boiled for thirty minutes and introduced without handling, seems to become incorporated into the bony tissue.

Case 2. A boy of 13, October 11, riding a horse was struck by an auto. Both tibia and fibula were broken five inches above the ankle with much destruction of tissue. There was an opening on the inner side four by five inches, skin flap and muscle ends being ground full of dirt and the fibula opening also bad. He was much shocked and cold.

When first seen in the operating room the wound was filled with mercurochrome and gauze applied. The patient was wrapped in warm blankets, morphine and glucose given, and in one hour had greatly improved. All injured tissue was carefully removed, with very free use of McDonald's solution. Instruments, towels and gloves were frequently changed. Finally the peg was placed and the position was easy to maintain.

The patient was very comfortable, but next day he had temperature of 103°, pulse 140; leg was red and painful. We took all sutures out of the flap, put on hot, moist, boric dressing from thigh to foot. By the fourth day he was doing well. The flap broke down and had to be filled in by granulation tissue. This required many dressings, as only a narrow bridge of good skin was left anteriorly and posteriorly.

From the first we could raise his leg by grasping the toes with one hand and the other under the knee, while the dressings were being changed. This caused no pain, there was no wobbling at any time and position was perfect. The soft tissues took much better care of themselves than in the usual method of cast or pin control and I am sure that bony union was good long before the wound had closed.

I had the good fortune to see Dr. Hendon's wards recently and, while his work is made up largely of referred nonunion cases, the method in use is fairly well presented. He has used the key in thirty-seven cases of fracture of neck of femur and to see these patients move about at will in ten days certainly makes an argument against the abduction cast. The humerus cases are all ambulatory from the first. I was informed that of the many hundred cases no key had been removed; no medullary infection had occurred; no death attributed to the method; and that bony union had occurred in some almost impossible cases.

In Chicago I was shown many cases of auto transplants by Dr. Speed, used in the medullary canal in the same manner. He said that 150 would be a conservative estimate of the number, also that he had never removed one from the canal or had serious deep trouble.

Recent reports of American and British surgeons, who do much fracture work, shows a marked increase in percentage of open reduction in simple cases. This, in the face of statistics showing a longer disability in open than in closed reduction for all reported cases in this country, and a steady increased invention of fixation apparatus, would lead one to think that a simple plan requiring no special apparatus, easily understood, and comfortable to the patient, might be a help in many long bone fractures.

In walking through fracture wards one constantly observes weights that are not keeping up extension. The patient often has devised a means of easing the pull. Casts are loose, even when originally well applied, and many skeletal tractions have led to infection and local necrosis that are no small part of the general anxiety.

I venture the assertion that, when complicated, little understood instruments and appliances are discarded and simple direct work is done with our usual equipment, bone surgery will be no more subject to infection than are other operations. A thin bladed, two-inch carpenter's chisel will take out a graft fully as well as the electric saw which we have discarded for many years in doing spinal grafts. In old nonunion cases these auto grafts are probably most logical, but in fresh fractures with shock we do not care to add time to the necessary work and so keep the meat bone pegs for emergency. Open operation on fractures is possible in any hospital worthy of the name.

HEMOLYTIC STREPTOCOCCAL GANGRENE *

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PORTLAND, ORE.

While only a few cases of hemolytic streptococcal gangrene are reported in the literature, we believe it to be more common than is thus indicated. Since seeing our case we have seen another in the same hospital. Thus two cases have occurred in Portland recently.

Meleney,[1] in 1924, reported twenty cases from the clinic of the Pekin Union Medical College in China, and in 1929[2] he reported eleven other cases seen in four years in New York.

Early diagnosis of the disease presents several difficulties to one who has not previously seen it, due to the apparent similarity to other conditions from which it differs widely. However, after it has been brought to one's attention the diagnosis will be made at once. The early recognition gives the patient the benefit of early operative relief and a hope of recovery. Meleney states that delays in treatment and amputations were done when his first cases in Pekin appeared. Through this experience he worked out a treatment which brought gratifying results.

From the study of his series Meleney gives a composite picture of the condition which is clear and definite as follows: Hemolytic streptococcal gangrene is a clinical entity distinct from erysipelas which it greatly resembles. It may occur at any age, male or female. It usually begins in the extremities but may attack any part of the body surface. It has been seen on the face, scalp, chest, breast, abdominal wall, back and scrotum. The infection usually starts in a superficial break of the skin, but occasionally develops without any observed lesion.

It is characterized by its alarmingly rapid spread in the first twenty-four to seventy-two hours. The part becomes red, hot, swollen, painful, heavy and quite useless, and later may become numb or even anesthetic. The margin of redness and swelling is not raised and usually is not clearly demarcated, but fades off gradually into relatively normal skin. Besides the local pain the patient has very marked general malaise which usually goes on to profound prostration or apathy, with an indifference to his surroundings and a total lack of appreciation of the severity of his illness.

A chill may usher in the general symptoms but is not a common feature. Fever may be high at first but in most cases does not go above 100° F. The pulse, however, is usually correspondingly higher. On the second, third or fourth day the pathognomonic signs of the disease appear. Patches of the affected skin begin to take on a dusky hue and blisters or large bullae develop, which may break and discharge a dark serous fluid. During this time the red area continues to spread in all directions. Lymphangitis and lymphadenitis are rare but phlebitis may occur.

In untreated cases from the fifth to the eighth day the discolored areas go on to black or gray gangrene, while other dusky areas appear and the spread continues. From the eighth to the tenth day the gangrenous areas begin to separate at their margins and the spread of the disease may cease. Subsequent separation of the dead skin discloses widespread necrosis of the subcutaneous tissues, the extent of which may be determined only by incision. The necrosis may spread up the whole length of the arm or leg, or involve the whole circumference of the limb. Some cases come to a spontaneous standstill, the slough separates, the undermined edges gradually become adherent and epithelium grows over. In the majority of untreated cases the process continues to advance, blood cultures become positive, and metastatic abscesses form in the lungs or in the subcutaneous tissues at pressure points, where bed sores develop or in other regions where collections of pus take place with little or no reaction except moderate swelling and slight rise in temperature.

In cases in which the disease comes to a spontaneous standstill and the necrotic skin sloughs off, the general symptoms clear, the temperature falls and the patient takes an interest in life once more. In cases which steadily and rapidly progress, the prostration becomes more and more profound, the mind becomes more and more clouded, the process in the lungs or other deep foci spread and death ensues.

Meleney's cases all showed on culture hemolytic streptococci in pure culture. Blood culture was positive in our case. In erysipelas the organisms may be found beyond the red zone of the spreading margin. Not so in this condition. In hemolytic streptococcal gangrene the edema is sterile, the organism being found only in the neighborhood of the subcutaneous slough. Because of the clear-cut

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* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

1. Meleney, Frank L.: Arch. Surg., Vol. 9, No. 2, p. 317.

2. Meleney, Frank L.: J. A. M. A., Vol. 92, No. 24, p. 2009.

clinical picture presented, one would assume that the characteristic features are due to some peculiar biologic characteristic of the causative organisms. However, Meleney was not able to prove satisfactorily by experimental means that the organism has a predilection for the subcutaneous tissues, although this seems to be so. When the organisms are inoculated into animals in large proportions, subcutaneous necrosis takes place similar to that occurring in human beings.

The relation of noma to this condition is not yet determined. Wassermann was positive in both cases here reported.

Meleney's experience is that proper treatment of these cases consists in prompt operation. As soon as the skin shows the slightest purplish discoloration, the beginning of gangrene, incisions should be made through this necrotic skin to the limits of the subcutaneous necrosis as shown by the incisions. The incisions should be made down to the deep fascia and carried just beyond the areas of subcutaneous necrosis. If they are not carried that far, the necrosis will almost certainly spread, whereas if this is done, the process will almost certainly subside. The incisions drain the tissues which are cut and relieve the tension of the member. Forcing fluids internally and removing the products of the disease and liquefaction are important. Soakings and irrigations are useful, chlorine solution being preferred. Amputation is not indicated except where the infection has been carried down to the bone. In a compound fracture amputation may be done above the joint from which the bone extends.

Skin grafting is indicated, when the flaps have become adherent and new epithelium has begun to grow on the margins. Reverdin are more successful than Thiersch grafts. Metastatic abscesses should be incised as soon as possible, even though there may be no local reaction except swelling and a general rise in temperature. These incisions need not be radical.

Case 1. August 11, 1930. When first seen our patient, C. T., female, age 46, was suffering from severe pains in the chest, abdomen and legs. Temperature 98.6°. No cause for the pains could be found from physical examination except the locomotor ataxia, from which she was known to suffer.

The next morning the pains continued. Temperature 102°, pulse 100. Physical examination again revealed nothing except what looked like an infected insect bite on the right upper arm. Hot saline applications were ordered. At 4 p.m. the temperature was 104°, pulse 100. Physical examination showed an indurated area on the anteromedial aspect of the right upper arm, surrounding the supposed insect bite. This was firm and red over a small area. The redness suggested erysipelas but was not raised and was not sharply demarcated, the color fading gradually into normal skin. There was considerable prostration. We do not believe the pain had any connection with the subsequent course of events.

August 13, second day. A.M. Temperature 103.5°, pulse 105, respiration normal, prostration less. There were several bullae filled with serum in the region below the insect bite. They looked like burns. The attendant apologized profusely for having burned the patient but felt sure the water could not have been too hot as she had tested it before applications were made. Liquids and alkalies were given freely.

In the afternoon the attendant telephoned that the bullae had taken on a yellowish appearance. A complete blood count, blood cultures and cultures from the unopened bullae were made at this time.

At 6 p.m. the temperature was 103°, pulse 105. Physical examination again was negative except the right upper arm, where the redness, edema and induration had increased markedly. There had been no chills. The pains in the legs and abdomen were now very much less.

Blood examination showed hemoglobin 58 per cent, red blood cells 5,560,000, white blood cells 12,500, polynuclears 87 per cent, small lymphocytes 12 per cent, large lymphocytes 1 per cent. Smears from the bullae showed a gelatinous material but no organisms. The Wassermann was plus or minus in the first tube, the others being negative. The first and second tubes, however, held for some time.

August 14, third day. The temperature 102.5° to 104°, pulse 100. Three or four small dark areas, purplish, appeared under the skin of the upper arm on the anteromedial aspect. Hot saline packs were continued.

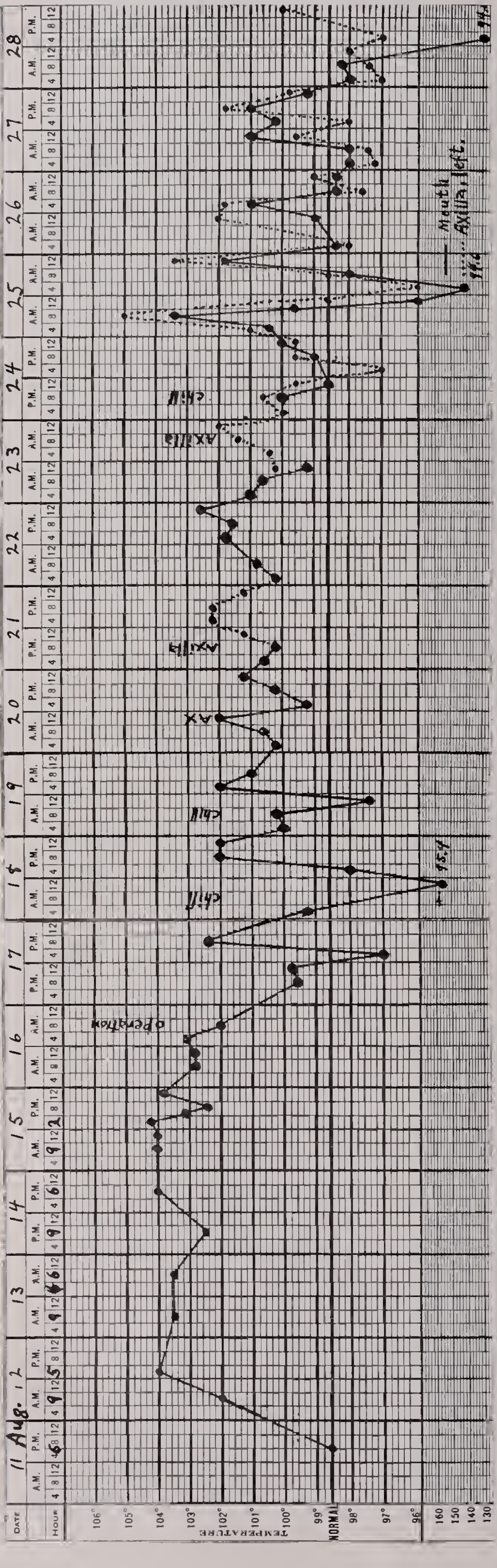
August 15, fourth day. Temperature 104°, pulse 96. The arm was quite edematous. The dark areas of yesterday are now definitely gangrenous. There is considerable prostration. At noon consultation was called in. For three days she has had incontinence of feces and has been irrational at times. She was sent to the hospital with the diagnosis of streptococcic infection and a therapeutic dose of streptococcic erysipelas antitoxin given intramuscularly, which was repeated the next morning. Magnesium sulphate dressings were applied.

At 8 p.m. the temperature had dropped to 102.4°, pulse 90 and of good quality. The respiration was not rapid. The condition of the patient seems fairly good. The arm had lost much of its redness and was paler in color. Infiltration not so brawny.

August 16, fifth day. Temperature 103°. By evening we made a definite diagnosis of hemolytic streptococcal gangrene. A consultant was again called and confirmed the diagnosis. As soon thereafter as possible the infected area was freely incised down to the deep fascia, three long incisions being necessary to open adequately the gangrenous areas. When incised the tissues exuded a thin, watery fluid which came also from remote regions. As the incision crossed the point of the initial infection the watery fluid was mixed with a very small amount of yellowish-white pus. Carrel tubes were placed into the depth of the incisions and the wound packed with moist boric acid gauze. Upon her return to bed Dakin solution was started.

When incised the tissues had a peculiar appearance, being grayish-white and water-logged with wide-spread, necrotic areas under the skin. Specimens of both the clear and pussy fluids were taken for examination and showed isolated streptococci, not more than three in a chain, the majority but two.

August 17, sixth day. Temperature 99.6°, which dropped to 97° at 4 p.m. and rose to 102° at 8 p.m. Blood examinations on the fourth and sixth days differed little



Case 1. Temperature chart. Solid line, mouth temperatures. Dotted line, temperatures of opposite axilla. It will be noted that the axillary temperatures, taken at the same times, were frequently from one to three degrees above those of the mouth.

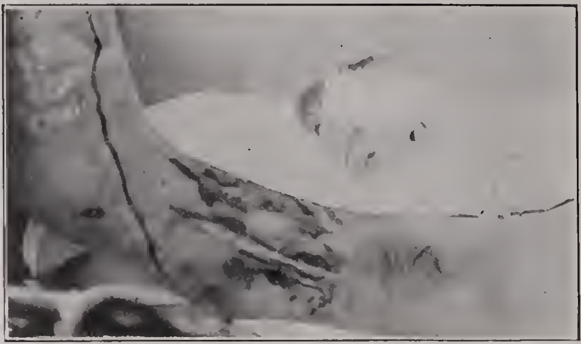


Fig 1. Case 1. Condition on the sixth day, twelve hours after incisions were made. Note the gangrenous area on the upper arm and the marked edema of the forearm.

from that of the second, except that the white count was slightly lowered, being 10,000 and 9,800 respectively. Urine on the fifth and sixth days showed marked traces of albumin (fig. 1).

August 18, seventh day. Temperature 99.2°. Condition not so good. The gangrenous skin was more extensive than at the time of operation. Several dark areas on the upper third of the forearm were opened, clear, water-white fluid exuding therefrom. The blood culture made before the patient entered the hospital on the second day was negative. The second on the sixth day was positive for hemolytic streptococci. Slides made from the broth showed short chains, none of which contained over seven cocci; most but three or four.

In the p.m. temperature dropped to 95.4° and then rose to 102°. The general condition not so favorable. Blood transfusion, 500 c.c. was given without reaction.

August 19, eighth day. Condition much improved. The color was good. She was rational and in her normal, cheerful mood. Dakin solution irrigations continued. New necrotic areas in the forearm were opened.

P. M. Condition seemed a little more favorable. The right axillary and clavicular regions were markedly edematous. She had two chills today. Her condition was better than before transfusion.

August 20, ninth day. A. M. Irrational part of the morning. Edema in the pectoral and clavicular regions was slightly less. No chill. There was no superficial extention of the gangrenous process. The edema was distinctly less. Appetite better.

August 21, tenth day. Irrational at times.

August 22, eleventh day. Every effort was made to prevent the breaking down of the reddened area over the sacrum. Throughout the illness she has had incontence of the bowels and retention of urine.

August 23, twelfth day. There has been no apparent extension of the process in the last few days. Large areas of skin are sloughing.

August 24, thirteenth day. Gangrenous skin over approximately one-half the surface of the arm and forearm beginning to separate. General condition improved, although she is depressed as she realizes the condition of her arm. Slight chill this morning.

August 25, fourteenth day. Temperature went from 103.4° to 94.6° and back to 102° during the day. For several days the left (opposite) axillary temperature has been one or two degrees above the mouth temperature. Two chills today. Large masses of gangrenous tissue were removed and pockets undermining the skin were opened, exposing the underlying muscles and nerves. Blood vessels were thrombosed where they penetrated the necrotic areas. When the gangrenous skin was raised there were revealed large spaces which exuded a yellowish fluid. Drainage of the liquefying tissues was promoted in every way.

August 27, sixteenth day. Patient depressed and incoherent at times. Great masses of gangrenous tissues were removed with scissors from the upper and lower arm. The gangrene extended under the skin to and between the muscles. The muscles of the upper arm and forearm were exposed as in an anatomic dissection. The skin was hard and dark, while the subcutaneous tissues were soft and gelatinous, exuding a yellowish, pussy fluid. As much as possible of this gangrenous and liquefying tissue was removed and the pockets opened widely. Drainage was free and fluids were forced. Dakin solution was continued.

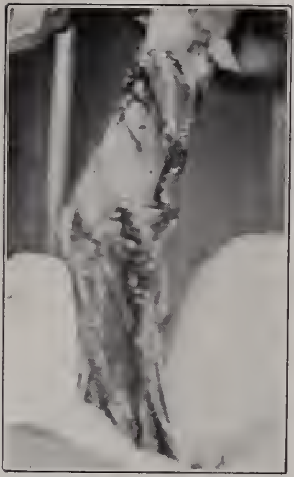


Fig. 2. Case 1. Seventeenth day. Showing the wide area of gangrenous skin of the arm and forearm, leaving deeper tissues as in an anatomic dissection.

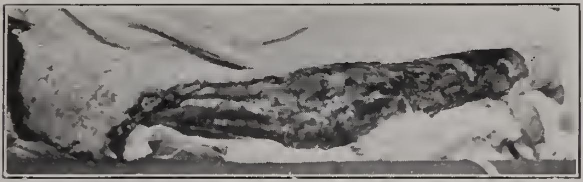


Fig. 3. Case 1. Postmortem. Showing the wide-spread gangrene with an area of intact skin in the deltoid region.

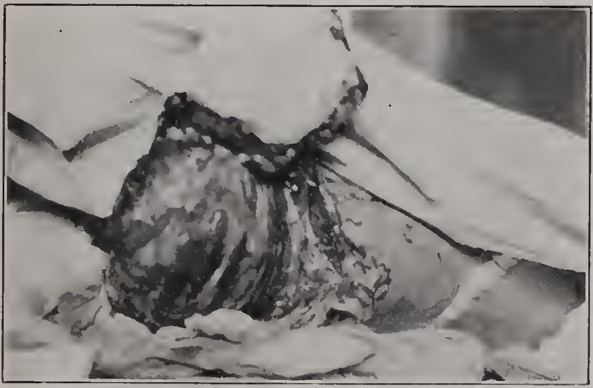


Fig. 4. Case 1. Postmortem. Showing the gangrenous areas in the deltoid, scapular and pectoral regions. The arm is upraised.

P. M. Patient was irrational and comatose at times. Condition was decidedly not good.

August 28, seventeenth day. Condition was very bad. Large pieces of gangrenous skin and subcutaneous tissue were again cut away. The denuded area extended from well over the scapula to the wrist. All the skin between these two points was removed except a flap anteriorly over the deltoid. The absorbing area, including the under surface of the skin and pockets, was conservatively estimated as over two square feet. With so large an absorbing area toxemia could not be prevented (figs. 2 and 3).

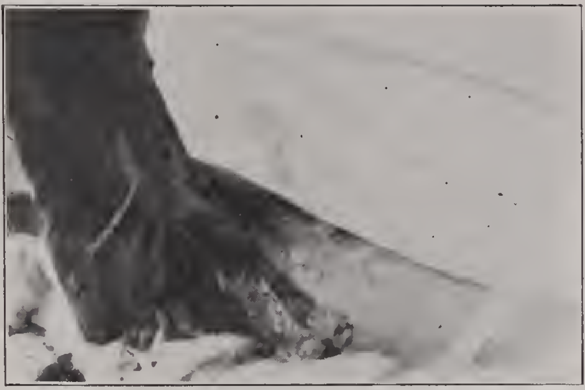


Fig. 5. Case 1. Showing the gangrenous involvement of the axillary region, arm and chest. The arm is upraised.

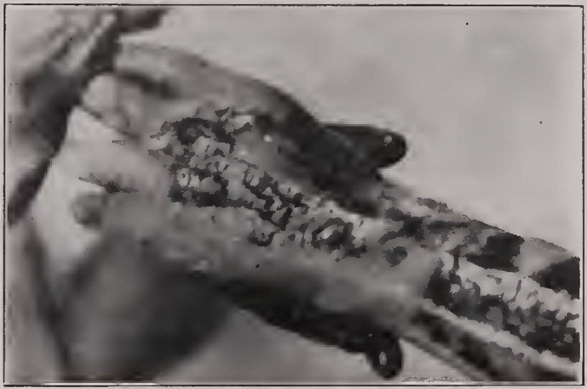


Fig. 6. Case 2. Showing the wide-spread gangrene of the hand and forearm. It extended well up on the arm.

August 29, eighteenth day. Patient died.

Autopsy revealed wide-spread necrosis of the skin as described above. The left lobe of the liver was enlarged to the size of the right. There was a scar in the right lobe. The spleen was mottled purple and gray. The kidneys showed mild nephrosis. There were no metastatic abscesses in the internal organs, although they showed the usual effects of toxemia. There were several small abscesses on the left upper arm (figs. 4 and 5).

The photographs which were taken during the progress of the disease and on the postmortem table show the rapidity of the process and the enormous amount of tissue destruction.

Case 2. Presented through the courtesy of Drs. Berkley and Anderson. Male, age 43. Auto mechanic. On the evening of December 11, 1929, while at work he received a small scratch over the distal end of the second left metacarpal, posteriorly. Tincture of iodine was applied at once. The next night the back of the hand and wrist began to swell with a little redness and slight pain. The patient sought medical advice and was sent to the hospital December 14, the third day. There was some systemic reaction.

December 16, fifth day. Hand and arm from the finger tips to the axilla badly swollen, with pitting edema and redness over the back of the hand. Several small, broken-down, pussy areas developed. Pulse full and bounding. Temperature went as high as 104° on two occasions. He had no chills. Wassermann positive. Large areas of gangrenous skin were later removed from the arm and forearm, requiring skin grafts (fig. 6).

Hot boracic acid packs were used for about one week and mercurochrome also was applied, with the process rapidly extending. On about the eighth day hexylresorcinol solution (S. T. 37) was started and improvement was very noticeable in twenty-four hours. Recovery has been very slow.

COMMENT

Hemolytic streptococcal gangrene is a clinical entity that should be easily recognized when one has once seen the condition. The most important clinical characteristics are the rapidity of development, and the profound prostration. The pathognomonic sign is a dusky, purplish hue of the skin with or without blisters or bullae and usually appearing on the third, fourth or fifth day and followed by gangrene.

The condition resembles erysipelas but is distinguished by certain clinical and pathologic characteristics. The margins are not raised and usually are not clearly defined. Dark blisters, bullae and dusky skin appear early.

The condition differs from ordinary streptococcal cellulitis by the greater rapidity of development, by the rarety of lymphangitis and lymphadenitis and by the appearance of dusky skin and blisters.

In sharp contradistinction to other streptococcal infections, adequate incisions should be made as soon as the condition is diagnosed.

629 Medical Arts Building.

THE NONSURGICAL TREATMENT OF PILES*

A SIMPLE OFFICE PROCEDURE

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It is a very peculiar thing that the injection treatment of piles has been practiced so seldom by the legitimate medical profession. In London, in 1924, Graeme-Anderson read a paper before the American Proctologic Society, wherein he made a great effort to prove that this therapeutic procedure had its inception in England. One who knows England only a little can understand that no effort would have been made to claim a treatment which was unworthy.

The success of advertising ambulant proctologists is probably due more to this therapeutic trick than to printer's ink or radio broadcasts. Many people fear the knife or the anesthetic; they desire a cure for piles which does not cause them to suffer or to lose time in hospitalization. Surely the legitimate medical profession can understand their reactions. And by listening to their wishes and granting their desires for nonsurgical treatment, charlatanism shall be cheated of its clients and quackery receive a lusty blow.

The trick is not a difficult one; the results are quite gratifying. One needs an obturator-endoscope, the larger the better. One should see what he is doing. Also one should have an injection-syringe and a needle three or four inches long. A little lubricant, some 10 per cent phenol in olive oil, a cotton pressure-swab, some mercurochrome solution and two deft hands are the remaining requisites.

The patient lies upon the left side with knees flexed. Introduce the lubricated endoscope and bring the piles into view. If they are prolapsing, reduce them first. Manipulate the endscope so that the piles present singly or all at once. Select the place to introduce the injection. Touch it with a drop of mercurochrome. Inject into the center of the pile. Briefly stated, that is all there is to it.

But it isn't so simple as that. Some individuals have piles with stenosis, fissure or crypt and you cannot introduce an anoscope of sufficient caliber to see what you are doing. In that case use anesthesia locally, by application or injection. If piles are prolapsed and cannot be reduced, some recommend that they be injected in situ. Personally I have never done this.

Various injection fluids are recommended: phenol in varying strengths, quinine and urea hydrochloride, Pond's extract, alcohol, collossal and colloidal metals, salicylate solutions and various sugars. The effect of any of these is about the same, but phenol, in mild solution of 5 or 10 per cent, is the drug that is almost universally employed by those who have had the greatest experience.

Particularly do I consider this treatment a good one for a doctor to use, whose practice is not urban. It is my impression that any doctor who sticks to it can achieve results by this measure which will be gratifying to patient and doctor alike.

Figure 1 shows the patient in position upon the table.

Figure 2 shows how to anesthetize the sphincter by application where possible, by injection of the sphincter when necessary.

Figure 3 (a) exposing the piles with the sphincteroscope. (b), (c) Injection.

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* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

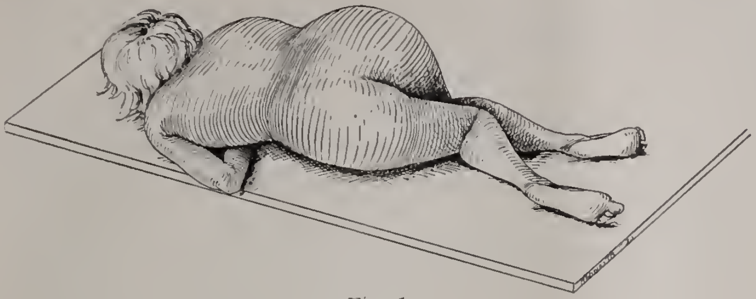
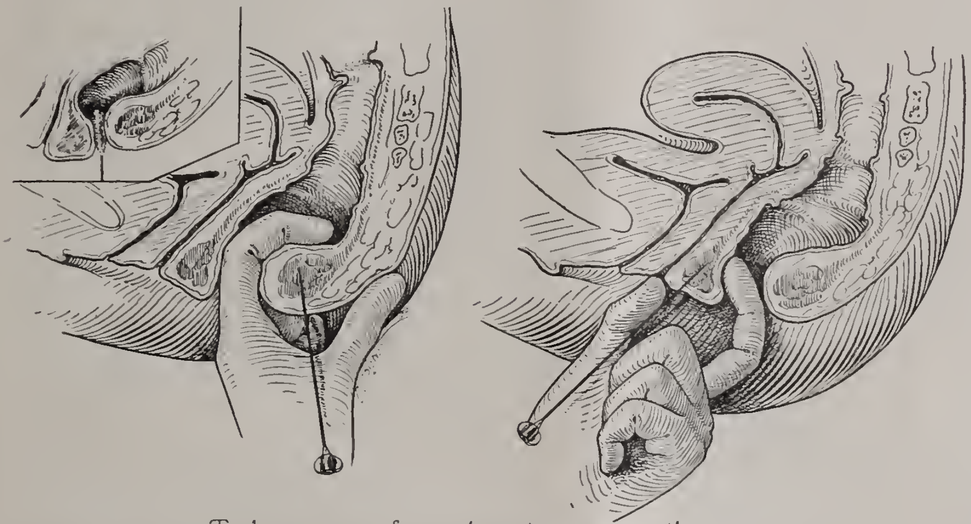


Fig. 1



Technique of sphincter anesthesia

Fig. 2

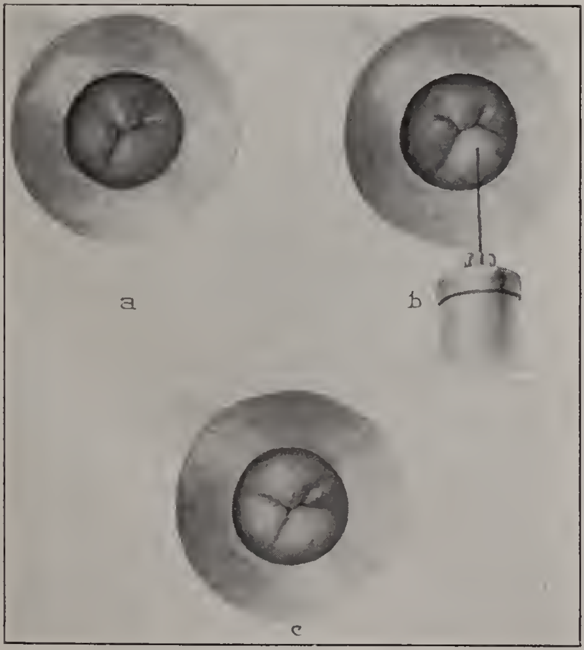


Fig. 3

Do not depend upon the amount of solution injected, watch for the color change. Watch for the blanching of the pile, with capillaries becoming visible in the blanched mucosa. Inject all three if possible at one sitting. Repeat each week.

1. What type of pile is susceptible to this treatment?

A. Practically all internal, except very large prolapsing of very badly ulcerated piles.

2. How many treatments required?

A. Four to twelve, average about eight.

3. Is it a permanent cure?

A. Sometimes it is, sometimes not. It is likely not so promising of permanent cure as operation.

4. What complications occur?

A. Several. Chiefly slough, submucous abscess, hemorrhage, great pain, even septicemia. All of these I regard as faulty technic. And even in the presence of faulty procedure any of them is rare.

5. Does it hurt?

A. No, the work is done above the area of sensory nerve supply, and if it hurts, the injection has been too low.

6. Does it lay the patient up?

A. Not at all. If properly done he notices nothing except that his bleeding piles cease to bleed, his prolapsing piles stay out.

7. Do you use it for external piles?

A. It is useless for external piles.

8. Contraindications?

A. Stenosis, fissure, abscess or fistula, or in the presence of violent acute inflammation. Or, possibly also, in the tough, sclerotic type of pile, where infiltration is great.

When skin tabs are abundant, always excise them either before or after the pile treatment. This surgical removal is painful and the treatment cannot proceed until the wounds have healed. I prefer to remove the tabs before treating the piles. I have treated the piles and left the tabs but always regretfully, since their presence prevents a desirable cosmetic result; possibly also a clinical result that is completely satisfactory.

INTRAVENOUS UROGRAPHY BY MEANS OF UROSELECTAN *

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Owing to the untoward reactions and difficulties that at times are encountered in cystoscopic or retrograde pyleography, search for a substance suitable for intravenous urography has been going on ever since 1918, when Cameron demonstrated the opacity of the iodide molecule to the roentgen rays. In 1923, Rowntree, Osborn, Sutherland and Schol were the first to use sodium iodide intravenously for the purpose of outlining the urinary tract. No satisfactory pyeloureterogram was obtained. Consequently the attempts were abandoned for some time, until the advent of the Cole-Graham method of cholecystography, when intravenous urography seemed more probable than ever before.

However, no satisfactory progress was made until 1929, when Swick[1] of New York prepared a substance which has been given the name of "uroselectan," working with the aid of the Emanuel Libman Fellowship in the Medical Department of the Altnouer Hospital, Berlin, under Professor Lichtwitz; and at the Urological Department of the Saint Hedwig Hospital, Berlin, under Professor von Lichtenberg wtih the collaboration of Professor Binz and Dr. Rath.

This substance, although it contains forty-two per cent of iodine, has a low degree of toxicity. Swick states that 180 grams of urolselectan dissolved in water can be given intravenously to a man weighing 60 kilograms without danger of poisoning. To ascertain the toxicity of uroselectan, Galbraith and Mackey[2] of Glasgow used rabbits for experimental work. They administered a standard human dose per kilo to one group of rabbits; to another group they gave seven and a half times the standard amount. In no instance, even with the larger doses, was any toxic effect observed. The animals were sacrificed at variable periods, some immediately, and others as late as forty days after the administration of uroselectan. Microscopic examination of the kidneys, removed from these rabbits, failed to reveal any evidence of damage to the renal parenchyma. These experimenters also brought out another noteworthy fact, that no improvement in the radiographic picture followed the use of the larger doses. Accordingly, there seems to be no advantage in using more than the standard dose.

The clinical dose for a human adult is forty grams of the substance dissolved in 100 c.c. of distilled water. After the solution has been filtered and sterilized, the injection should be given slowly into a vein. Roentgen-ray pictures are taken one quarter of an hour, three quarters of an hour, and one and one quarter hours after the injection.

The patient should micturate between each roentgen-ray exposure, as otherwise the solution in the bladder becomes so opaque as to obscure the lower end of the ureters. He should also be prepared by restricting the fluids for at least twelve hours before the injection is given.

Although my experience with this method of urography is limited, it is my belief that one should have a definite knowledge of the patient's renal function before subjecting him to this type of urologic study. This information can be obtained by injecting phenolsulphonepthalein intravenously, and estimating the percentage of dye eliminated in fifteen minutes. If the renal function as measured by this method is less than ten per cent, the kidneys will not secrete uroselectan in sufficient concentration to produce pyeloureterograms that are capable of interpretation.

The intravenous method of pyelography by means of uroselectan is very valuable in all cases where the renal function is good and the urinary findings are normal. In such cases the diagnosis of tumors is readily made when located in the kidney region. We can easily discover ureteral lesions, such as obstruction and hydronephrosis, as well as renal displacement and renal anomalies. It is of value also in localizing of shadows seen in the plain roentgen-ray film that make us suspect stones in the urinary tract.

In some of the cases with abnormal urinary findings, this method of pyelography is of inestimable aid to the urologist, where catheterization of one or both ureters is impossible, and when cystoscopic manipulations are inadvisable on account of either the presence of infection, or the patient's age or condition; likewise, where retrograde pyelography leaves one in doubt as to the exact diagnosis; and, finally, when there is a question as to the cause of a distortion in the urogram, such as is often seen from splinting of the ureter or kidney pelvis by the catheter.

An over- or underdistention of the kidney pelvis or ureter by the opaque medium is also at times

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* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

confusing in pyelograms made by the retrograde method. In such cases, intravenous pyelography will usually make clear the diagnosis.

As to the value of uroselectan in the testing of the renal function, I can only say that we should not depend on this test alone. However, if a pyelogram made by uroselectan shows a normal pyeloureterogram on one side, and if there is no visualization of the kidney pelvis or ureter on the other side, we know that the kidney function is poor or absent where the opaque medium fails to show.

The intravenous method of urography is contraindicated in patients who are acutely ill, or in those having a very low renal function. It should not be used where the diagnosis of early tuberculosis or early tumor of the kidney is to be made by pyelography, as the pyelograms in such cases, made by uroselectan, are usually not sufficiently clear to enable us to make an accurate diagnosis.

A SIMPLE PROCEDURE FOR THE PHOTOGRAPHING OF ROENTGEN-RAY PLATES

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SEATTLE, WASH.

For two years we have made it a practice to report quarterly the progress made by our referred tuberculous patients to family physicians. A year ago we began sending with these reports a conveniently sized photograph of the patient's most recent chest roentgenogram.

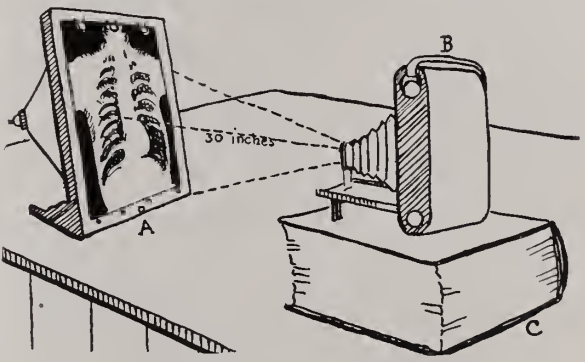
These were made for us by a commercial photographer who printed our 14x17 films on sensitized paper and reduced the impressions. By this process we were given a 3x4 print, whose lighting was the reverse of the original negative. Only one firm in Seattle would undertake to do this work. The charge to us for each 3x4 print was $2.50, whether we used one or ten. The demand for additional photographs for relatives and patients quickly assumed proportions that made the procedure prohibitive in cost.

We then purchased a clinical camera outfit, with which good pictures and lantern slides could be made directly from a brightly illuminated roentgen-ray film. With this outfit, which cost $180, good impressions could be made on small films at a cost of ten cents each. Prints cost six cents each.

Our latest step has been the discard of this camera outfit and the substitution of an ordinary kodak. With the set-up in the accompanying sketch we have been able to take photographs of roentgen-ray negatives of any size, as satisfactory as any produced with our more expensive camera or by a professional photographer.

Any type of camera down to the simple box variety may be used. We use a 3A postcard size kodak, equipped with a rapid rectilinear (U.S. 4) lens. (Any f. 8 or Kodar f. 7.9 lens is equivalent.) We added a No. 5 portrait attachment at a cost of 75 cents. This is a supplementary lens used in front of the regular lens, its effect being to decrease the focal length of the rectilinear to permit of working closer to the subject. By its service our kodak with focus set at six feet focuses accurately at thirty inches.

The time used is eight to ten seconds by watch or roentgen-ray timer. The best diaphragm aperture for sharp definition we have found, is U.S. 128 (f. 4.5). We use ordinary roll film, on which six to ten impressions of different negatives may be made in twenty minutes.



A. Vertical 14x17 illuminator with a p 25, 120 volt, 150 watt, bowl frosted, blue Mazda lamp. B. Ordinary postcard size (3A) kodak with a No. 5 portrait attachment placed in front of regular lens. C. Book used to raise midpoint of kodak lens to level of midpoint of roentgenogram. Points are thirty inches apart.

Individual plates, films or lantern slides may be made with this type kodak by the addition of a combination or lantern slide back. By means of this device the photographer has the advantage of ground glass focusing and, if he so desires, can make one or two exposures and develop them at once. It costs $4.

Any make of 14x17 vertical roentgen-ray illuminator may be used for chest work. An inexpensive one, having a single p 25, 120 volt, 150 watt, bowl frosted, blue, Mazda lamp, has proven adequate for all our purposes. The 14x17 illuminator may be made to accommodate any size roentgen-ray negative by the use of the black paper which comes with 14x17 films, cut to the desired size and pasted to the flashed opal glass of the illuminator.

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* From Seattle Convalescent Home.

By this simple method the lighting of the small print is identical with the original roentgen-ray negative. Printed on paper with glossy finish these prints are ideal for half-tone reproduction in medical publications.

Films may be developed in roentgen-ray negative solutions.

White ink used on the light, subdiaphragmatic area of a chest roentgenogram will show black on the light background of the finished print. White ink on dark areas of the reduced film will show white on the print.

306 Stimson Building.

HEALTH EDUCATION*

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Ever since the creation man has struggled consciously or unconsciously to maintain himself fit for the contest of survival. Health has been of prime importance since man's inception on earth. It is not strange that man has always employed speccialists to minister to the health of the group.

In mythology this office of physician had been held by Aesculapius, and his daughter Hygeia has been known as the goddess of Hygiene. The influence of superstition, faith in the supernatural, has not been overcome even in the present day.

The first great physician, Hippocrates (B. C. 460), aptly called the Father of Medicine, recognized disease as an abnormal process of nature and appreciated the processes of nature in healing. This was the first great blow against superstition and mysticism in disease.

Galen (A. D. 130-201) stands out as one of the dominant figures in medicine for over 1500 years. He was perhaps the founder of scientific medicine through experimentation, but he was also the leader of unfounded dogmatism which is responsible for holding back medicine for 1500 years. Perhaps no other one individual has been so influential in retarding medical advancement as this man.

Some of the best descriptions of disease that have been written have come from the pen of Aretaeus. His accounts of tetanus, epilepsy, hysteria are especially fine. In his writings the first description of diphtheria is found. It has been indicated that Aretaeus understood inspection, percussion, palpation and auscultation.

The next great figure on the horizon was Rhazes (860-932), representing the Arabian medical knowledge of that time; in fact, the golden age of Arabian medicine. Rhazes has been credited with writing the first book on pediatrics, and the first to introduce chemical preparations into practice.

Paracelsus (1493-1541) had no use for the medicine of his day. It is fortunate for medicine, indeed, that he attacked the dogmatism of Galen which had cast a spell over medicine for more than a thousand years. The discovery of zinc is due to Paracelsus. The use of copper sulphate in therapeutics owes much to him. He also insisted upon cleanliness of wounds and insisted that suppuration was bad healing.

Michael Servetus (1511-1553) was the discoverer of the lesser circulation. For the discovery of the pulmonary circulation, the most momentous physiologic discovery of the age, he was condemned to death. The edition containing his discoveries was effectively destroyed by fire.

Working with Servetus was Andreas Vesalius (1514-1564), the first great anatomist. He made so many discoveries it is difficult to enumerate them. Before, and even after his time the human body had been little used for dissection. In dissecting the human body instead of the bodies of animals, it was possible for him to show in many instances where Galen was incorrect; hence another blow at Galenism was dealt. His book, "De Humani Corporis Fabrica Libri Septem," stands out paramount in the golden age of anatomy in which he lived.

Ambroise Pare (1517-1590), perhaps the world's first great surgeon, numbered among his accomplishments the ousting of boiling oil as a cautery for wounds, and substituted in its place the ligature. He also used this method of amputation. Pare was the first to demonstrate that gunshot wounds were not poisonous.

Descartes (1596-1650), a philosopher and independent thinker, did much in breaking down traditions which were holding back progress and opened up new avenues of approach. His writing did much to break the bonds upon the human mind.

"The seventeenth century saw great activity in medicine. At this period we meet Sydenham, the English Hippocrates; Willis, who differentiated between diabetes mellitus and diabetes insipidus; Felix Platter, who published the first classification of diseases; Glisson, who published a classic account of rickets; Thuillier, who showed that ergot was due to corn smut; Bontius, who described beriberi;

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*Read before the Conference of City and County Health Officers, Portland, Ore., Sept. 17, 1930.

Colle and Musitano, who showed that syphillis could be conveyed by kissing and from drinking vessels; Guarinoni, who described gummata of the brain; Ramazzini, who opened up new medical territory, the immense field of trade-diseases.

"The microscope now became scientifically available, and Leeuwenhoek bought hundreds of them, ground half a thousand lenses himself, and discovered the outposts of the invisible world of bacteriology, while Athanasius Kircher cast a suspicious eye on these recently-revealed microorganisms, already regarding them as the cause of infectious disease. Leeunwenhoek's pupil, the young Johann Hamm, first focused on the spermatozoa; Swammerdam viewed the red blood-corpuscles; Malpighi found the capillary anastomosis between arteries and veins; Robert Hooke saw and drew the plant cells; and Clopton Havers described the microscopy of bone.

"Obstetrics emancipated itself from the midwives, and was molded into a science by the hands of such men as Mauriceau, Deventer, Paul Portal, de la Motte and van Hoorn. The obstetric forceps was invented at this time by the Chamberlens, but it is not with pride that the historian records it, for this useful instrument was kept a secret in the family for generations. Nature frequently puts talents into the wrong hands.

"Chemistry was advanced by the labors of van Helmont, who introduced the term and concept of 'gas'; by Lemery, who demonstrated the presence of iron in the blood, and whose Cours de Chemie was a valuable compendium of the chemical knowledge of the time; by Sylvius (de la Boe), who proved the presence of volatile alkalis in plants, and trained several eminent pupils; by Boyle, who enunciated the law of pressure upon gases which is still known as Boyle's Law, and who applied Francis Bacon's inductive method to chemical problems; by Mayow, who was on the trail of oxygen and the true theory of respiration.

"Although all the excreta of all the animals retained their honored places in the pharmacopeias of the period, the materia medica was enlarged by the introduction of numerous remedies which have a more modern sound.

"Work of enduring value was done in otology and ophthalmology, especially by Duverney, Maitre-Jean, Brisseau, and J. J. Rau. Gastrotomy, resection of the jaw, amputation of the thigh, transfusion and intravenous medication were among the surgical procedures introduced at this time.

"But if seventeenth century surgery did not advance further than Pare, workers in anatomy and physiology poured far beyond the broad gate that the scalpel of Vesalius had opened; half the structures in the human body are named after seventeenth century men—Graafian follicles, Haversian canals, Glasserian fissure, Pacchionian bodies, Bellini's tubes, antrum of Highmore, Malpighian layer, circle of Willis, valves of Kerkring, Schneiderian membrane, Glisson's capsule, Casserio's artery, Peyer's patches, Lower's tubercle, Pecquet's cistern, Poupart's ligament, Wormian bones, Ruysch's tunica, Spigelian lobe, Ridley's sinus, Riolan's muscle, Tulpius' valve, Vieussen's ganglion, Nuck's canal, Wirsung's duct, Wharton's duct, Stensen's duct, Rivini's duct, Bartholin's glands, Brunner's glands, Cowper's glands, Meibomian glands.

"To this period belongs the 'triple discovery' of the lymphatics, the lacteals and the thoracic duct, and it followed the chief physiologic discovery of all time—Harvey's demonstration of the circulation of the blood. Harvey's book on the subject was published in 1628, not in London, however, but in Frankfort-on-the-Main, as the British censor, with the characteristic intelligence of censors, refused to permit its publication at home, though today England considers the author of De Mortu Cordis its medical Shakespeare."

Malpighi's (1628-1694) observations on the exchange of blood from the arteries to veins resulted in his being regarded as one of the world's greatest microscopists and the founder of histology. The discovery of capillary anastomosis between arteries and veins completed Harvey's hypothesis. Malpighi contributed much to the knowledge of the work of the glands, the liver, spleen and kidneys.

Surgery received a great impetus under the guidance of John Hunter (1728-1793). An important discovery was that collateral arteries are capable of continuing circulation, if passage in the main trunk is arrested.

One of the most prominent of the early men influencing preventive medicine was Edward Jenner (1729-1823), whose researches and discovery of vaccination opened up new fields of thought in the eradication of disease.

Henry Cavendish (1731-1810), whose exact experiments in chemistry were the forerunners of many important discoveries in chemistry, gave us the first analysis and some of the properties of water.

Karl Scheele (1742-1786), a Swedish apothecary, developed chemistry in relation to medicine far in advance of any previous knowledge. Among his discoveries were tartaric acid, barium oxide, chlorine, glycerine, citric acid, oxalic acid, hydrocyanic acid, as well as many others. He was one of the first to investigate hydrogen and sulphur. A new method of producing calomel was devised by him. Through his work on milk it was demonstrated that lactic acid was the cause of sour milk. His researches with prussian blue were the foundation for much of our present knowledge of cyanides.

Berzelius (1779-1848) was responsible for the first simple and rational system of chemical notation. Much of the terminology, vocabulary, nomenclature is based on his work. Berzelius added five chemical elements to the scale: cerium, selenium, silicon, zirconium and thorium. Analytic chemistry owes much to the work of this man.

About this time Augenburger gave percussion to medical profession and ushered in a new era of modern diagnosis.

Samuel Guthrie (1782-1848), an American, gave chloroform to the world and devised means of obtaining it in large quantities. Two others discovered chloroform simultaneously but Guthrie developed the method of preparing it in quantities.

Another name of great moment in medical diagnosis is Rene Laennec (1781-1826), who gave the first satisfactory description of peritonitis. To pathology he added Laennec's catarrh, Laennec's pearls, Laennec's cirrhosis, Laennec's thrombus and Laennec's rale. The disease that interested Laennec mostly was tuberculosis and through this interest he developed the stethoscope; and so auscultation was born. This has ever been one of the high lights of physical diagnosis. Through this means the death rate of tuberculosis was materially reduced. This discovery was responsible for the development of great interest in the study of thoracic troubles.

Johannes Purkinje (1787-1869) was the first of the great experimental physiologists. His work on the eye, photometry, the hearing of deaf mutes through bones of the skull, his original description of bone, cartilage, blood vessels, gastric glands, nerve cells with axones and dendrites, the Purkinje fibers of cardiac muscle, introduce a new era in physiology. He was the forerunner of the cell theory of Schleiden and Schwann.

Schleiden (1804-1881) and Schwann (1810-1882) gave to the world the cell theory. Schwann was among the first to announce that infusoria do not originate by spontaneous generation. A few years earlier Leeunwenhoek, the discoverer of the microscope, saw bacteria for the first time and helped pave the way toward the destruction of the spontaneous generation theory finally put to rest by Pasteur.

With the advent of Jacob Henle (1809-1885) the whole field of medicine was greatly enhanced and new pathways were opened, especially in histology and anatomy. His work on the eye, the epidermis which begins modern knowledge of these tissues, and the urogenital system of which the most interesting discovery was the uriniferous tubule, were contributions of the greatest magnitude. Henle predicted and foreshadowed the theory that contagion was due to microorganisms. His theories were later sustained by one of his students, Robert Koch.

It was during this period that anesthesia began to be used upon a scientific basis. Who is responsible for this boon to suffering humanity is difficult to answer. The Egyptians used Indian hemp and hasheesh to numb the pain; more than six thousand years ago the Babylonians used mandragora. The Greeks recognized the use of soporifics.

Anesthesia is practically an American discovery by Long, Morton, Jackson and Wells. The public operation by Warren and the removal of a lady's molar painlessly in England by Robinson went far toward introducing the practice. Anesthesia in childbirth was first used by Simpson in Scotland. He discovered chloroform and thought it was ether.

Electrotherapy was introduced in medical treatment and experimentation by Duchenne (1806-1875). This pioneer neuropathologist has not received the fame which is his due for his contributions.

A new phase of medicine is beginning to appear upon the horizon, ushered in by Claude Bernard (1813-1878). His work on the pancreas, liver and glycogen introduced the term "internal secretion." The ductless glands receive great impetus through the work of Brown-Sequard and Sojous. Brown-Sequard's work on rejuvenation has challenged the world. Sojous' work introduced a new era into medicine, for who today would consider an examination or autopsy complete without considering the endocrine glands?

Dermatology was born or standardized by Ferdinand Hebra (1816-1880). From his time on Vienna has been the center of dermatology.

Associated with Hebra at this time was one of the most tragic figures of medicine, Ignaz Semmelweis (1818-1865), who introduced antisepsis into childbirth and began the reduction of loss of life through puerperal fever. Semmelweis was the forerunner of Lister. He insisted that attendants at delivery and at examinations should wash their hands in a solution of chlorinated lime. He further insisted on clean bedding for confinement cases. For this important contribution he was ridiculed by jealous contemporaries, from which treatment he developed insanity which terminated in his death while a comparatively young man. Lister introduced carbolic acid into surgery and antiseptics to the world, one of the greatest events in the history of medicine.

In the latter part of the nineteenth century the world was startled by the work of Pasteur and Koch. Bacteriology was born and preventive medicine at last came into its own. Who has not heard of the names of Pasteur, Koch, Metchnikoff, Bering, Katosko, Roue, Laveran, Gaffy, Pfeiffer, Loeffler, Ehrlick and Wassermann?

So we see that through the long travail in the development of medicine, it has had three eras: First, that of resignation, characterized by superstition, witchcraft, spirits, demons and the supernatural; the second period that of defense, largely concerned with curative medicine and general sanitation; and now the third or the offensive period, which is interested in preventive medicine.

Health education is one of the phases of the preventive medicine program. Its contribution is large but many times misunderstood or unrecognized. In this paper we wish to touch upon only one of the many phases of this work, namely, the work done in the elementary schools.

Perhaps the best manner by which attention can be focused on its contributions is to explain the program. Health education has been defined as "the sum of the experiences in school and elsewhere which favorably influence habits, attitudes, and knowledge pertaining to the individual, community and racial health." "More specifically, health instruction is the sum of instruction given within the curriculum which has for its aim the improvement of the health conduct of the individual." Health instruction may be given directly and also through the integration of health material with other school subjects.

A brief outline of a school health program may be suggestive of the work which might be carried on in the school system:*

I. School health supervision:
  A. Medical service:
    1. For pupils.
    2. For teachers, health examinations and preventive treatment.
    3. For custodians and all other employees of the Department of Education, health examinations and preventive treatment.
  B. Dental service:
    1. For pupils.
    2. For teachers, prophylactic only.
  C. Disease prevention.
  D. Health supervision of special classes:
    1. Crippled children.
    2. Open air.
    3. For the mentally defective.
    4. Conservation of sight, pending.
  E. Sanitary inspection of school plants.
II. Physical education:
  1. For pupils of:
    a. Elementary schools
      (1) Required.
      (2) Extracurricular.
    b. High school
      (1) Required
      (2) Extracurricular.
  2. For teachers.
III. Health instruction:
  1. Supervised teaching of hygiene and nutrition from kindergarten through the eighth grade.
  2. Health teaching through the basic subjects in the secondary school.
  3. Correlations.
IV. Mental, emotional and social health, extracurricular activities, etc.
V. Training of teachers in service.
VI. Summer playgrounds.

Some fundamental education principles involved in a health education program are:

1. Successful health teaching must be positive. Pupils must be stimulated to live right rather than to think about disease and limitations.

2. Successful health teaching is habit formation and must be continued through the child's school life, approached with sufficient motivations to avoid monotonous repetition.

3. Desirable health habits can only be formed by actual daily practices.

4. There must be a definite checking up and recognition of the health achievements of the child by the school. Health standards must be concrete so that the child can know when he has reached his goals.

5. The psychology of the child's own classroom group is an effective factor for stimulating the individual child to higher health standards. It is necessary that the teachers should live and share the children's health experiences with them. Much of the success of health teaching depends on the attitude and understanding of the teachers in relation to the welfare of each child. The psychologic approach to health teaching as in all other teaching must be varied with various age levels.

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*This material largely taken from Metropolitan Life Insurance Monographs.

6. Health needs of children in various school districts are different, and these differences must be met. In the less privileged districts it is futile to attempt higher standards than the environmental conditions of the home will permit. School health activities must have as a first consideration the welfare and happiness of each child.

7. Emphasis on health information as well as habit formation must be stressed in the grammar grades.

The teacher's function in the program may be summarized as follows:

1. Motivating health habits by direct and indirect lessons, correlations with school projects and subject-matter.

2. Carrying out systematic inspection in a form which will motivate the child's conduct and will result in an increasing sense of group as well as individual responsibility.

3. Inquiring into and stimulating interest in the child's home regime of health practices, developing individual as well as group contacts.

4. Cooperating with and interpreting the child to the home; seeking and encouraging consultations with parents.

5. Monthly weighing and measuring of each grade with the record tabulating and posting of results, sending home monthly weight cards.

6. Cooperating with the school nurse in the correction of physical defects.

7. Cooperating with the school nurse and nutrition worker in cases of tuberculosis, and 10 per cent underweight children, reporting to and cooperating with the nutrition worker in the visiting and instruction of homes where there is need of information on diet.

8. Cooperating with the physical education instructors in recreational activities and in the development of habitual correct working posture, as well as in the carrying out of corrective exercises.

9. Reporting problem, maladjusted or exceedingly nervous children to the school psychologist, carrying out the treatment prescribed and assisting in interpreting the child to the parents.

10. Assisting in checking causes of all absences.

11. Directing the serving of midmorning milk lunches.

12. Assisting in the control of communicable diseases.

The school administration should seek the cooperation of the local social agencies in its health education work. Women's clubs can help as mediums for interpreting the purpose and plan of the school in its attempt to assist in bringing about a higher standard of community health and efficiency.

The local Board of Health or the County Health Unit may furnish school doctors and school nurses. It may also maintain a free dental clinic. The work of the examining physicians, as well as the control of communicable disease and immunization treatment, should be in the hands of the local Board of Health.

The State Department can be of help in follow-up work, immunization and supplying educational material. Its Bureau of Child Welfare is also ready to cooperate with local communities and is doing so in many instances.

In the control of communicable disease the state and local boards are paramount.

As has been stated, the control of communicable diseases is exercised by the Board of Health. All physicians or parents, in cases where physicians are not called in, should be required to report communicable diseases within twenty-four hours. Regulations as to exclusion from and readmission to school of children from families, where a member is suffering or has recently recovered from certain communicable diseases, should be strictly enforced.

The Department of Health has available for physicians such biologic products as diphtheria antitoxin and toxin-antitoxin, and smallpox and typhoid vaccines.

The Board of Health should mail to the school attendance department a daily list of all children reported as having contagious diseases. These reports should be promptly mailed by the school department to the various school principles. When there are repeated cases of the same contagious diseases in one school, a daily inspection by the school doctor should be made.

The above represents a simple health education program in the school. Simple as it is, yet if followed out it will result in a surprising benefit to the community in opportunity for growth, development of social efficiency, the correction of physical defects, improvement of general health conditions and the prevention of disease. Much of the work done in the school reaches the home and the entire community is benefited therefrom.

The part you gentlemen can play in this program is obvious. It is hoped that this paper may stimulate your interest so that you will act as leaders in your communities in stimulating school boards and public opinion to the end that this vitally important work becomes a reality in the school system.

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EDITORIAL

GREETINGS

At the beginning of the new year it is customary with some individuals to review the events of the past twelve months with a feeling of congratulation for the successful accomplishment of certain endeavors and with regrets for failure of other attempted efforts. At this season there is probably an unusual number of people included in the latter class, owing to the unfortunate universal financial situation. Members of the medical profession are no exception in these respects to the general groups of mankind. Fortunately the great majority of people are optimists. They aim to minimize past disappointments, with expectations of successful future accomplishments. This characteristic is an asset of every resourceful physician. In the routine experiences of the busy doctor disappointments and failures in treatment of certain cases are inevitable. In fact, they comprise an important factor in the evolution of every successful and efficient practitioner. It is to be hoped that all of our readers may possess and accentuate this spirt of optimism for the coming year. No more worthy greeting could be extended to one's friends.

In contemplating the medical accomplishments of the past year, this period has not been distinguished by the epochal discoveries and scientific attainments which have characterized some of the years in recent medical history. In fact, there is a natural limitation to the possibilities of continuous outstanding medical discoveries. Yet there is no check upon the perpetual spirit of investigation and research which are inherent in the efforts of a noble body of medical workers who are laboring assiduously for the solution of certain hitherto unsolved medical problems. Some of these may yield at any time to the labors of these persistent research workers in a manner that will be a surprising revelation to the medical profession and the expectant public. May such results reward the honored body of scientific investigators, whose discoveries constantly afford the greatest blessings to suffering mankind.

THE TYPHOID CARRIER

One of the notable achievements of preventive medicine of recent years has been suppression of typhoid fever. Older practitioners have vivid recollections of this fever being endemic throughout this country some thirty years ago. During a large portion of the year the treatment of these cases comprised a substantial portion of the practice of all physicians. The discovery of the typhoid bacillus and the role which it played in the production and dissemination of this fever resulted in its practical elimination in some sections and marked suppression throughout the land. Its maintenance in certain localities at present depends primarily upon the existence of the typhoid carrier. An individual so afflicted may harbor the causative bacillus in the digestive tract through years or for the remainder of his life without presenting symptoms of the disease. Cholecystectomy is said to eliminate the condition in about one-third of the carriers.

Scattered about the state of Illinois* are about one hundred known individuals who are chronic carriers of these organisms. They are under constant supervision of health officials and are under agreement to abstain from business associated with food products. They are regularly visited by representatives of the department of health who keep in touch with their occupations and activities. A large proportion of them have been responsible for epidemics of typhoid fever. It is believed there are probably double this number in the state who are undetected. If a similar supervision were carried out intensively in other states, so that all disseminators of typhoid bacilli were so guarded that pollution was prevented from all of them, there is no question that typhoid fever could be eliminated and it would become merely an historical disease. While these fever cases are infrequent at present in our states of the Northwest, the monthly reports of the Boards of Health rarely fail to record one or more. Hence the causative bacilli continue to function, probably in the intestinal tracts of carriers. If all of these could be identified and placed under permanent supervision as above described, the disease would disappear within a brief period.

GINGER PARALYSIS

During the past winter and spring many references appeared in the daily papers concerning cases of ginger paralysis, which appeared in large numbers in certain sections of the country. It was characterized by paralysis of the extremities and in some cases was so extensive as to prove fatal. It followed the consumption of ginger extract as a beverage and was colloquially known as "jake paralysis."

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* Illinois Health Messenger, Vol. 2, No. 24, Dec. 15, 1930.

The United States Public Health Service has made an extensive study of samples of ginger extract which have appeared to be the cause of these paralyses. It was discovered that the ginger was in no way responsible but paralysis was due to the phenol preparation tri-ortho cresyl phosphate, technically known as tricresyl phosphate, used in the manufacture of varnish, shellac and similar preparations. Chemists of the Prohibition Bureau had found similar substances in suspected extracts. Administration of this preparation to certain animals produced exactly the same kind of paralysis as followed the drinking of "jake." The Public Health Service failed to find a single case of paralysis caused by ginger preparations manufactured by reputable pharmaceutical concerns. Why this substance should be employed as an ingredient of a substandard fluid extract of ginger has not been ascertained. If the dire consequences of drinking this preparation had been suspected, it would probably never have been included. This incident has raised the question whether there may not be other organic combinations employed for the treatment of disease which might be worthy of the careful attention of investigators.

THE AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

During recent years the development of numerous specialties has necessitated means for the verification of the claims of proficiency on the part of practitioners announcing themselves as specialists. The specialty of obstetrics and gynecology is the last to adopt this plan. The American Board of Obstetrics and Gynecology is composed of nine members and examiners elected by the three national associations of obstetricians and gynecologists. The purpose is to improve the standards of practice of obstetrics and gynecology. By regular examinations it will endeavor to determine the competency of obstetric and gynecologic specialists who apply for certificates. Applicants will be divided into three classes. Some outstanding specialists will be granted certificates on the basis of their attainments by vote of the entire examining board. The second group will receive certificates after undergoing a practical clinical examination, while the third, composed of younger practitioners, will be required to take written and clinical examinations, and submit rceords of groups of cases treated. No well qualified obstetrician and gynecologist should have any difficulty in obtaining a certificate.

The organization of this board has just been completed and the first examination for candidates will be held simultaneously in nineteen different cities of this country and Canada, on March 14. Washington, California, Oregon and Nevada are grouped in one district, for which the examination will be held at Portland. Dr. Jennings C. Litzenberg of Minneapolis will be the examiner. Detailed information and application blanks may be secured from Dr. Paul Titus, Secretaary, 1015 Highland Bldg., Pittsburgh, Pa.

ANNUAL MEETING OF NORTH PACIFIC SURGICAL ASSOCIATION

The annual meeting of North Pacific Surgical Association was held in Tacoma on December 5 and 6, under the presidency of Dr. Charles D. Hunter. Dr. Emil Ries of Chicago, an authority on surgical pathology, gave three lectures. In the first, on "Carcinad Phases of Cervix Uteri," he described the progressive pathologic changes in the infected cervix and emphasized the importance of minute lesions which were unobserved in the casual examination but which indicated malignant tendencies. He demonstrated the use of the colposcope for identification of these lesions, especially early leukoplacic changes. His other subjects were, "Manifest and Occult Ruptures of Laparotomy Wounds" and "Peritoneal Growths and Sampson Mucosa Implants." Dr. Ries' talks were based on large clinical experience, careful observation and sound independent thinking.

The program presented by the members was marked by papers of unusual interest. Especially noteworthy was the presentation by Dr. W. K. Livingston of Portland, outlining methods for "Prognosticating the Results of Surgery of the Sympathetic Nervous System," and rationalizing and standardizing as far as possible the indications for operations in a field of surgery marked by contradictory evidence and opinions. Dr. Karl Martzloff of Portland gave a second report of the progress of his research work on "The Fate of Mucosal Inclusions in Gastroenterostomy Wounds Following Various Types of Suture Technic." Drs. E. O. Jones and J. Tate Mason of Seattle, in two excellent papers, discussed the problems in the management of carcinoma of the large intestine.

Saturday afternoon was given over to the urologic subjects. Dr. A. W. Hunter of Vancouver, B. C., reported three cases of primary papillary tumors of the ureter, two benign and one malignant, diagnosed preoperatively. His experience with these rare tumors has been unusual. The entire meeting was marked by enthusiastic discussions. Dr. Peter A. McLennan of Vancouver, B. C., was elected president and Dr. Milton G. Sturgis was reelected secretary-treasurer. The next meeting will be held in Vancouver, B. C.

THE CONTRACT PRACTICE PROBLEM

During recent months much ardent and even bitter controversy has arisen in discussion of the merits and weaknesses of contract practice. In Washington the problem has occupied much attention in the meetings of King County Medical Society, where its consideration has excited considerable personal feeling among those supporting different sides of the question. Recently a statement was issued by the Committee on Public and Industrial Relations of that society which this journal was requested to publish. It seemed unwise to comply with that request, lest favor might seem to be extended toward those supporting one view of the controversy. Now the opponents of the claims of this committee have prepared a reply to its statement, the publication of which has also been requested. Since both sides of the argument can thus be considered continguously, it has been decided to publish both of these statements, which will be found on subsequent pages. They appear without endorsement of this journal which maintains a neutral attitude so far as an expression of opinion is concerned.

MEDICAL NOTES

OREGON

An Active Quackery Firm. An expose of "The International Endocrine Gland Specialists" of Portland was published in the November issue of *The Bulletin of the Oregon State Medical Society*. These "specialists" are graduates of regular medical schools. Dr. N. C. Hampton has practiced in Portland since graduating from the University of Oregon Medical School in 1915. Recently, in association with "Dr." R. L. Philips, a chiropractor, he specialized as the "Dean" of the Northwest Rectal and Colon Clinic. The other gland specialist is Dr. G. L. Cousineau, a graduate of Hahnemann Medical College and Hospital of Chicago in 1905 and the Chicago College of Physicians and Surgeons. He was licensed to practice in Oregon in 1912. He was refused a license in Colorado in 1928 and in February of 1930 was convicted in Denver of practicing without a license. By means of large advertisements in the Portland dailies these modern quacks are doubtless succeeding in victimizing many gullible individuals. Being regular licensed practitioners their suppression will probably be difficult. If suitable publicity were available as to the truth of this sort of practice, it might be possible to counteract the deception which is thus exploited to the public.

Medical Contentions Before the Industrial Accident Commission. A committee representing the state medical society has presented the following contentions to the commission with a request for corrections: First, they insist that the commission should not sanction contracts between employers and hospital associations and that existing contracts should be terminated. Second, it is urged that injured workmen should be permitted to choose their own physicians. Third, it is suggested that a committee of physicians should be appointed for the arbitration and decision of controversies between the commission and the individual physician. After hearing from a representative of one of the hospital associations and discussions by physicians the matter was taken under advisement. It is hoped that these deferred changes may be ready for presentation before the next session of the legislature.

Hospital Unit Advocated. The U. S. Veterans' Bureau at Portland has become overcrowded with patients. Senator Steiwer has introduced a measure in the U. S. Senate for an appropriation of $10,000 for an administration building for this hospital.

Change of Hospital Superintendent. Miss Signe Wahlstrom, superintendent of Salem General Hospital, has resigned from this position. Her successor is Mrs. Mildred Lenoir, former superintendent of the Pierce County hospital at Tacoma.

Addition to Hospital. It is contemplated to erect a new five story wing for the Emmanuel hospital at Portland at an estimated cost of $160,000. Plans are being made to finance the proposed improvement.

Elected President of Staff. Dr. J. M. Simpkin has been elected president of the Wesley hospital staff at Marshfield. Dr. M. E. Wilson was elected secretary-treasurer.

New Hospital Contemplated. Real estate negotiations were recently completed which will precede a new hospital at McMinnville. Plans for this building are being made by Dr. John Manning. It is proposed to spend about $40,000 in construction.

New Manager for Hospital. A new manager has been appointed for the Deaconess hospital at Salem. This is Mr. Frank F. Wedel, son of the founder of the institution. He has been associated with the management of the hospital for the past fourteen years. It is under the management of the Mennonite church, being organized about fifteen years ago.

Elected Hospital President. Dr. O. C. Hagmeirer has been elected president for the ensuing year of Columbia hospital at Astoria. At a meeting of the board of directors, he described contemplated improvements to be made at the hospital during the coming year.

Lost Radium Recovered. Last month radium valued at $7000 was recovered from the Portland city incinerator by the professor of physics at Reed College. It had been discarded with bandages on a patient for whom it was being used. By means of the electroscope one quartz phial was found intact. The radium-impregnated ashes from the other was carefully preserved.

Chiropractors Demand Representation. Chiropractors have made the request for representation on the medical staff of the Industrial Accident Commission. They claim there are many industrial accident cases, where their particular art would be of special benefit to injured workmen. They think the industrial commission should give them an opportunity to handle such cases.

Doctor and Nurse Injured. County physician G. S. Newson of Klamath Falls and Miss Wetzell, county health nurse, while returning from school inspection and inoculations, were badly injured last month when their automobile was struck on the highway by a hit and run driver.

WASHINGTON

North Pacific Orthopedic Society held its annual meeting at Tacoma, December 20. About thirty-five members were present from Washington, Oregon, Montana, Utah and British Columbia. Papers were presented by representatives of leading cities of the Northwest, dealing with many orthopedic problems. The visitors were guests of Dr. E. A. Rich on Sunday morning, December 21, for a cruise on his yacht to Henderson Bay.

Seattle Surgical Society will hold its annual clinics February 6-7. Dr. Waltman Walters of the Mayo Clinic will be the guest speaker. He will present lectures and hold clinics on both days. Details as to places of meetings and the annual dinner will be duly published.

Enlargement of Hospital. The Naval hospital at Bremerton is to be enlarged by construction of sunrooms at the ends of the two main wings. These solaria will increase the capacity of the institution by about twenty-four beds.

Snohomish County Medical Society held its annual meeting at Everett, December 2. Besides members of the society, a large delegation was present from Seattle. The annual banquet and the meeting were held at the Everett Golf and Country Club.

Elected Club President. Dr. J. H. Peters of Anacortes was last month elected president of the Kiwanis club of that city. Dr. A. B. Cook was also elected one of the trustees.

Dr. J. S. Arnason of Seattle has returned home after six months study and travel in Europe. He visited clinics in Germany, Austria and Czechoslovakia. His travels carried him to his native country, Iceland, for the great celebration which was held on that island.

Dr. J. D. Brougher of Vancouver has taken over the practice which he has conducted with Dr. C. R. Zener, who has retired from active practice.

Dr. T. A. Kennedy, who has recently served as intern in a Seattle hospital, has located for practice at Washougal.

Dr. Norman C. Mace, who has recently practiced at Elma, has moved to Tacoma where he will be located for future practice.

IDAHO

Combination of Nursing and University Study. Beginning with this year, nurses who have completed prescribed courses at leading Idaho hospitals will be permitted to continue work at the state university for two years. This will enable them to obtain the degree of Bachelor of Science in Public Health. This plan is based on establishment by the larger hospitals of courses of study which will qualify the nurses for entrance to premedical university work.

Dr. F. E. Peterson, of Cottonwood, Ida., but recently of Salt Lake City, has located for practice at Chewelah, Wash.

Dr. F. J. Gist of Winchester has sailed for Europe, where he will spend several months in study in Vienna. He will devote most of his time to study of eye, ear, nose and throat.

Dr. O. J. Morehead has located for practice at Kendrick, having moved there from Mooorhead, Minn. He formerly practiced in Kendrick before moving to Minnesota.

Dr. F. A. Benjamin of Council has moved for practice to Payette. This will leave Council without the services of a doctor.

OBITUARIES

Dr. David Harriman Rand of Portland, Oregon, died in San Francisco, December 20, aged 69 years. He was born at Portsmouth, N. H., in 1861, shortly after he moved to Concord. At the age of eighteen his family moved to Oakland, Calif. He graduated from a San Francisco Medical School in 1883. He then moved to Oregon and graduated from the medical department of Willamette University in 1885. He located for practice at Portland, where he practiced until a few months ago, when ill health caused him to visit San Francisco. He served as city and county coroner from 1898-1902. He was a member of the visiting staff of St. Vincents Hospital for more than forty years, during which time he was a prominent member of the medical profession.

Dr. Charles W. Davis of Seattle, Wash., died after a long illness November 30, aged 70 years. He was born at Barnard, Missouri, February 23, 1860. His boyhood days were spent on a farm. After attending a Methodist Academy he graduated from the Missouri Medical College at St. Louis in 1884. For many years he had a very extensive country practice in Missouri. In 1901 he located for practice in Seattle which he continued until five years ago, when he retired on account of ill health. He was respected and beloved by a wide circle of friends and patients. He was a man of high character and conspicuous integrity.

Dr. Dan P. Albee died at West Point, Ida., November 18, aged 74 years. He was born in Arcadia, Calif., in 1856. He studied medicine in California but later graduated from the medical department of Columbia University, New York. He located at Oxford, Ida., in 1890. In 1893 he moved to Albion county where he taught school. In 1894 he practiced in Oakley until 1907 when he moved to Buhl. He served as mayor of that city. In 1912 he moved to Rock Creek, locating on a farm and quitting the practice of medicine. He was twice elected commissioner of Twin Falls county.

Dr. William B. Lyman, of Boise, Ida., died December 6 after an illness of about two months, aged 75 years. He was born at Lansing, Ia., in 1855. He graduated from Rush Medical College in 1881 and began practice at Eau Claire, Wis. For six years he was superintendent of the state hospital for the insane at Madison. Later he practiced at Spear Fish and Sturgis, S. D. He located at Boise in 1905, where he was in active practice until about two years ago.

Dr. J. A. Loundagin, formerly of Portland, Oregon, died at San Francisco, December 14, after an illness of about a year. He was a graduate of University of Oregan Medical School and practiced in Portland and Vancouver, Wash. He moved to California about a year ago.

REPORTS OF SOCIETY MEETINGS

OREGON

JACKSON COUNTY SOCIETY

Pres., G. W. Gregg; Secty., E. W. Shockley

A meeting of Jackson County Society was held at Ashland, December 3. The society was entertained with a crab supper by Drs. M. B. and H. M. Shaw. There was an attendance of twenty-two, including doctors from neighboring cities. A paper was read by Dr. D. J. Barkwill of Portland on various phases of sinus infection.

A meeting of the society was held at Medford, Dec. 17. D. M. Brower of Ashland read a paper on "Forty-two Years in Practicing Medicine."

LANE COUNTY MEDICAL SOCIETY

Pres., O. A. Walter; Secty., H. G. Talbot

Lane County Medical Society held a regular meeting at Eugene, December 18.

The chief feature of the meeting was election of officers for the ensuing year which was quite spirited, owing to contests for the different positions. Dr. O. A. Waller of Eugene was elected president, Dr. H. G. Talbot of Eugene was reelected secretary, with Dr. C. D. Donahue vice-president and G. S. Beardsley, censor.

POLK-YAMHILL-MARION SOCIETY

Pres., G. C. Knott; Secty., W. W. Baum

Polk-Yamhill-Marion Medical Society held a regular meeting in Salem, December 2.

Dr. J. Guy Strohm of Portland presented a paper on "Some Genitourinary Conditions, Diagnosis and Treatment." It was discussed by Dr. V. E. Hockett of Salem.

Dr. John G. Manning of McMinnville gave a demonstration of work accomplished with an artificial larynx of his design and manufacture. A patient was presented who spoke entirely through this apparatus, after having been unable to use his voice for more than two years.

PORTLAND CITY AND COUNTY SOCIETY

Pres., F. A. Kiehle; Secty., H. P. Rush

A meeting of Portland City and County Medical Society was held at the Portland hotel, December 17.

The business of the meeting was the election of officers for the ensuing year. They were as follows: President N. W. Jones; vice-president, A. G. Bettman; secretary, H. P. Rush; treasurer, Kittie P. Gray. Members of the council, Marr Bisaillon, R. A. Payne, L. B. Kingery, J. H. Fitzgibbon, A. M. Webster, Karl Martzloff and W. H. Bueermann.

Delegates to the annual meeting of Oregon State Medical Society: H. P. Rush, L. P. Gambee, J. G. Cheetham, J. E. Else, Marr Bisaillon, Torfin Tharaldsen, A. W. Holman, F. E. Butler, Helen Cary, G. C. Schauffler, W. H. Bueermann, A. M. Webster, K. H. Martzloff, J. G. Strohm, Roger Holcomb, B. A. VanLoan, J. F. Wood and C. J. McCuster.

WASHINGTON

CLARK COUNTY MEDICAL SOCIETY

Pres., C. R Zener; Secty., J. R. Darby

Clark County Medical Society held a regular meeting at Vancouver, December 9.

The following officers were elected for the ensuing year: President, A. E. Bird, Camas; vice-president, J. C. Brougher, Vancouver; secretary-treasurer, J. A. Darby, Kalama. Censors: C. E. B. Flagg, Vancouver, R. S. Stryker, Ridgefield, L. L. Munn, Vancouver.

The society closes the year in a prosperous condition. Its membership numbers twenty, while that of 1929 was eight members.

KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the Auditorium of the Medical-Dental Building, Seattle, December 1, with Dr. D. H. Houston in the chair. About 175 members were present. Minutes of the last general meeting were read and approved.

Mrs. J. E. Collier, of the National Extension Society of the Florence Crittenden Home, spoke in the interest of this institution in Seattle and solicited the patronage of the physician for cases suitable for its care.

Dr. J. S. Lingenfelter reported a case of "Thrombocytopenia, Favorably Treated by Spenectomy." The patient was present and the pathologic spleen was demonstrated.

Dr. George R. Vehrz of Salem, Ore., read a paper on "Heart Beat and Respiration in Total Novocaine Analgesia," illustrated by lantern slides and moving pictures. As a result of operations on humans with total spinal novocaine analgesia, together with animal experimentation, it is determined that this procedure in proper doses permits unaltered cardiac and respiratory reaction. Large doses of novocaine in the fourth ventricle or cisterna magna block the cardiac and respiratory centers completely, death being due to respiratory failure. The Trendelenberg position is necessary in order that the blood may flow freely by gravity to the heart. The paper was discussed by Paul Flothow and Joel Baker.

Dr. George W. Swift presented a paper on "Original Research in Epilepsy," covering a period of five years of study. He pointed out that convulsive seizures are brought about by pressure on the cerebral cortex ventricles and cisterns by an accumulation of cerebrospinal fluid. Researches in the sphere of water metabolism have played an important part in our conception of epilepsy. Anomalous development of the transverse sinus causes a backing up of blood so that there is a failure of the normal outflow of venous blood from the cranial cavity. When the accumulation of the cerebral fluid reaches a state of pressure incompatible with the normal function of the brain, a sensory stimulation will set off the convulsive seizure. The underlying principles of correct treatment aim to prevent the accumulation of interstitial fluid within the reservoirs of the cranial cavity. This is accomplished primarily by regulating the intake of food and drink. The essayist described the surgical operation which involves the removal of a suitable area of occipital bone to aid in the relief of intracranial pressure. The paper was discussed by G. E. Price, A. T. Wanamaker and C. A. Smith.

A list was read of twelve applications for membership.

Dr. H. J. Davidson read a report from the Committee on Public Relations. By resolution he was delegated to represent the Society before the Board of Trustees of the Washington State Medical Association at a meeting to be held in Seattle in the near future.

Nominations for officers for the following year were made as follows: President-elect, J. H. Snively and Frederick Slyfield; secretary-treasurer, A. J. Bowles. Trustees: C. E. Gray, J. T. Dawson, D. H. Nickson, C. W. Shannon, H. J. Wright.

The following were nominated as delegates to the annual meeting of the state association: A. C. Crookall, H. E. Coe, A. H. Peacock, F. J. Clancy, J. T. Whitty, H. D. Dudley, E. W. Young, D. G. Dickerson, O. A. Nelson, Frederick Slyfield, A. T. Wanamaker, W. C. Speidel, G. W. Swift, Roger Anderson, A. O. Loe, W. T. Christensen, A. B. Hepler, Frederick Epplen, H. J. Davidson, Conrad Jacobson, G. W. Dowling, C. E. Hagyard, G. W. Beeler, C. E. Watts, D. C. Hall.

The medical section of the society held a meeting December 8, with Dr. Frederick Slyfield in the chair.

Dr. Frederick Epplen presented and discussed a case of polycythemia vera. Several months ago the patient had a red blood count of 10,000,000, hemoglobin of 120 per cent and markedly enlarged spleen. Intravenous injections of distilled water has reduced the blood count to 5,000,000 and hemoglobin to 86 per cent.

Dr. Warren E. Calvin reported observations on six hundred stool examinations. In many cases this sort of examination will give sufficient data for diagnosis without the employment of roentgen rays.

Dr. P. V. von Phul reported a case of a woman exhibiting extreme extra systoles. Rest and administration of quinidine cured the condition as long as it was employed. Relapses were frequent under its discontinuance. After a year's treatment the abnormality has disappeared.

LEWIS COUNTY MEDICAL SOCIETY

Pres., H. L. Petit; Secty., Rush Banks

A meeting of Lewis County Medical Society was held at St. Helens Hotel, Chehalis, December 9.

Senator Robert Somerville and Representatives A. S. Cory and Theo Albert were guests. There was a discussion of health measures likely to be presented at the coming session of the legislature. Miss Wilcox of Seattle, secretary of the Public Health League, was also a guest. She discussed the activities of the League in regard to public health matters.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Secty., G. C. Daniels

A regular meeting of Walla Walla Valley Medical Society was held at the Grand Hotel, Walla Walla, December 11.

The following program was presented: Dr. L. P. Anderson read a paper on "Tuberculosis Infection in Childhood." Dr. R. A. Gunter read a paper on "Tuberculosis in Adults."

WHATCOM COUNTY MEDICAL SOCIETY

Pres., E. C. Keyes; Secty., W. A. Hulbrush

A regular meeting of Whatcom County Medical Society was held at Bellingham in the auditorium of the Herald Building, December 1.

The principal speaker of the evening was Dr. J. J. Markey of Seattle who gave a demonstration of pneumothorax treatment for tuberculosis. He presented motion pictures of valves of the heart in action.

YAKIMA COUNTY MEDICAL SOCIETY

Pres., P. J. Lewis; Secty., R. L. Ross

Yakima County Medical Society held its regular monthly meeting at Commercial hotel, Yakima, December 8, Dr Paul J. Lewis presiding.

Dr. J. M. Blackford of Seattle presented a paper on "Follow-up of Hypertension."

The following officers were elected for the ensuing year: President, Kay England; vice-president, W. K. Cocklin; secretary, R. W. Shirey; treasurer, F. W. Nagler. Board of Censors: J. E. Bitner. Executive Board of Nurses Registry, G. E. Marcy. All are residents of Yakima.

TONSILLECTOMY IN TREATMENT OF ACUTE CERVICAL ADENITIS IN CHILDREN. Harry L. Baum, Denver (*Journal A. M. A.*, Dec. 13, 1930), advocates and defends the principle that it is *safe,* not dangerous, to remove tonsils and adenoids during the height of an acute anterior cervical adenitis, and that such treatment is the most satisfactory in its results of any yet advocated for the condition. Hence, the paper defends the performance of a surgical procedure which is contrary to preconceived opinion, recognizing the fact that the operation may frequently be done in such cases in as short a time as two weeks, or even ten days, from the date of onset of an acute tonsillopharyngitis. This defies a certain prejudice known to exist against early tonsillectomy following an acute tonsillar infection. With this prejudice, as applied to cases in which definite therapeutic benefit promises to accrue, Baum does not agree. He believes that the experience of this series of 40 cases amply supports the view that we should not permit preconceived opinion based more on theory than on experience to dissuade us from availing ourselves of whatever therapeutic measures are at hand when those measures seem to be and eventually prove themselves to be most valuable in the management of the particular conditions with which we are dealing. The problem under consideration fulfils these requirements and for that reason the author unhestitatingly recommends tonsillectomy as the treatment of choice in acute anterior cervical adenitis which follows a tonsillopharyngeal infection and fails to show definite signs of subsiding spontaneously within one week.

CONTRACT PRACTICE

STATEMENT OF CONTRACT PRACTICE

H. J. Davidson, M. D.
SEATTLE, WASH.
Chairman Committee on Public and Industrial Relations, King County Medical Society

The purpose of this statement is to define the position of the medical profession on the question of contracts under the Medical Aid Law and allied matters. Early in 1930 King County Medical Society ordered fact finding investigation and initiation of effort to correct certain conditions which were known to have progressed to the point of having become public health problems.

Official action of the medical society limited the activities of the committee to three specific problems:

1. Certain contracts under the Medical Aid Law.
2. Certain so-called medical contracts executed by doctors contracting under the Medial Aid Law.
3. Commercial solicitation of professional business, particularly to secure the above contracts, either by physicians themselves or by lay agents hired directly or through corporate agencies.

At all times the committee has confined itself rigidly to the official instructions of the society, has prosecuted its work solely on the merits of the problem, and has cultivated and maintained contacts solely for the purpose of promoting progress along the lines designated. Reports of affiliation with any organization or group with endorsement of program or policy beyond these enumerated place the medical profession in false light, confuse the issue, and misrepresent the position of those who are prosecuting the work.

No member of our committee sat in the House of Delegates of the Washington State Medical Association, September, 1930, or had voice in the deliberations of that body. Leaders in the House were urged by us not to endorse the program of labor beyond approving their program demanding amendment of the contract clause of the Medical Aid Law. Their endorsement of the demand for increased compensation during disability and increased award for permanent disability is regrettable in that those problems particularly involve employer and employee and should be left for their solution. The committee has given those items no consideration as they are outside its province, and the profession as a whole disapproves the portion of the resolution referring to disability compensation and permanent disability awards passed by the House of Delegates.

Th Medical Aid Law has been in operation thirteen years. Conceived in altruism toward the workmen to ease the financial burden incident to the surgical care of injuries, it has made possible the exploitation of medical aid fund by contract doctors for profit to the possible tragic detriment of the injured, a condition contrary to good financial and good public health policy.

The Law legalizes contracts and provides that the employer and employees in conference may choose the contract alternative. It does not provide nor does it specifically prohibit, nor was it the intent of the law that doctors should take the initiative, go themselves or send their hired lay representative to employers and groups of employees to solicit the contracts as they have done and are now doing.

Under the terms of the contracts as executed by contract doctors, ten cents on the dollar of the medical aid trust fund goes to the state for administrative expense; ninety cents on the dollar, at the time of collection from labor and industry, is turned over to the contract doctor. He is custodian of the fund; he administers it, determining what services shall be rendered, including his own professional services, hospital, nurses, drugs, appliances and even professional consultants. He disburses for all services and keeps as his own the unexpended portion. Therein lies the censurable financial policy, and therefrom arise the possibilities of detriment to public health.

In exploiting financial possibilities for personal gain under the law, contract doctors sometimes reduce services to injured workmen to the point of inadequacy and inefficiency. Under their administration of the fund a leg may be amputated to save the hospital expense incident to effort to save the leg, or workmen with fractures and serious internal injuries may be allowed to succumb without effort to determine and treat the internal injuries because of the hospital expense entailed during repair of the fractures in case life is saved. They hire laymen to solicit the contracts, thereby diverting a considerable portion of the fund to channels of commercialism and, as a corollary to the medical aid law contracts, contract doctors are carrying on a wildcat health insurance business. They are known to have paid up to 20 per cent of the gross revenue derived from the contract and up to $600.00 a month to lay agents, through whom the contracts were secured. Through the use of hired lay agents they secure contracts remote from their home towns, then sublet to local doctors for 25 per cent of the total revenue, their sole service being to secure and to sublet the contract, or they hire the cheapest available local doctor to render service under the remote contracts and often require him to pay them 50 per cent of the gross revenue derived from all private pratcice developed while in their employ.

In some instances a local physician has secured the necessary signatures to the petition intending to take over the contract for the industry. Remote organizations hearing of the fact, through influence they could bring to bear, caused word to be sent to the mill that the employees should rescind their signatures immediately or if necessary every employee would be fired and an entire new crew hired. In these instances the workmen contributed 50 per cent of the revenue and under the law are supposed to have equal authority with the employer, regarding who shall do their medical work under the Medical Aid Law. A remote group of physicians are so intrenched that they are able to take the bread and butter from the mouths of laborers, their wives and children unless the medical aid contract is awarded to them. The workmen have grievances on this score and about the adequacy and efficiency of the services to the injured, but they dare not protest.

The group of workmen included under the medical aid law contracts comprise convenient groups to bring into the wildcat health insurance activities. For from seventy-five cents to one dollar and fifty cents a month, contract doctors agree to render all professional services and pay all costs incident to the care of accidents not included under the medical aid law and all sicknesses with specific limited exceptions. This contract is a limited health and accident insurance policy with all the evil possibilities of wildcat insurance, to-wit:

1. The contract doctor is the insurer.
2. The insurer is unsupervised as to financial resources, and as to performance under his contract.
3. He determines the rates, administers the insurance fund, determines what services shall be rendered, renders that service personally or through agents in his hire, and retains the unexpended portion.

Any insurance actuary will testify to the fact the rate is utterly inadequate. Every man operating would go bankrupt in a short time, if he fulfilled the terms of the contract. Any unprejudiced physician will testify to instances of failure of the insurer to fulfill his contract.

A man with a perforating ulcer of the duodenum went nine times to the contract doctor. The eighth and ninth times he was so ill his son had to take him after refusal of the contract doctor to call at the home. No adequate history was obtained, absolutely no examination was made. He was given a box of pills, some ten cents in value, which proved so laxative that their use had to be discontinued. He then consulted his family physician who rendered proper service, including hospitalization and operation, incurring some $400.00 expense. The contract doctor willfully and negligently evaded financial obligation, the professional responsibility and effort to save for himself the cost of hospitalization and special nurses.

The ideals and ethics of the medical profession have through all time paralleled very closely those of the legal profession. The Legal Practice Act of the State of Washington specifically prohibits the use of hired lay solicitors for securing professional work for lawyers. It is declared to be against public policy. The Medical Practice Act does not contain any similar clause, although seventeen states and territories do have laws prohibiting the practice, with revocation of license as the penalty.

Such is a brief statement of some of the possibilities under the present laws. It is not sound finance, and it has tragic possibilities from the standpoint of public health.

To remedy the situation we propose:

1. An amendment to the present Medical Aid Law, providing that the doctor shall receive or have an interest only in that portion of the fund which he earns through personal professional service.
2. An amendment to the insurance code bringing the supplemental medical contracts under the jurisdiction and supervision of the Insurance Department, that the insured may be protected as to the financial stability of the insurer, that the rates may be regulated, and that the insured may have facilities for appeal in case of inadequate or inefficient performance by the insurer.
3. An amendment to the Medical Practice Act making it unlawful for doctors to solicit professional business, either personally or by lay solicitors hired directly or through corporate agency. The penalty should be revocation of license.

The critical activity of the medical profession is not directed against industrial medicine as developed by such companies as the Pacific Coast Coal Company, the Puget Sound Light and Power, and the Northwest Improvement Company. Under their system the fund is administered conjointly by the company and employees and individual cases are sent to doctors competent to treat the particular ailment, while the doctor has financial interest in only what he receives for his personal services. We recommend that provision for that type of service be retained.

A STATEMENT OF FACTS RELATIVE TO CONTRACT AND STATE PLANS OF MEDICAL PRACTICE

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BELLINGHAM, WASH.

President of the Society of Industrial Surgeons
of the State of Washington.

There has recently been issued some propaganda, signed by Dr. H. J. Davidson as Chairman of the Public and Industrial Relations Committee of the King County Medical Society, and who purported to represent that Society in his remarks. It attacks the present form of contract medicine and surgery under the present Medical Aid Law. This propaganda is largely inaccurate and cannot pass unchallenged.

It will be recalled that the original Industrial Insurance Act as enacted in 1911 contained no provision for the surgical care of injured workmen. This very unsatisfactory condition was remedied by the 1917 legislature which passed the State Medical Aid Act, the provisions of which have remained substantially unchanged since its enactment thirteen years ago.

This Act provided that the cost of the medical and surgical treatment should be paid for equally by the employer and employee. Two types of treatment were authorized, generally known as the "State Plan," and the "Contract Plan" of treatment. Where the "State Plan" operates the employee and employer pay their joint fee to the State which in turn pays the doctors for services rendered the injured workmen. Where the "Contract Plan" operates it is provided that upon the consent of a majority of the employees and employer, a contract for the care of injured workmen can be executed with any physician or hospital association for a period not to exceed three years. However, the Supervisor of the Industrial Insurance Division is required to investigate fitness and ability of the surgeon or hospital association to render satisfactory service prior to this arrangement becoming effective.

The policy of the legislature to exact an unusually high professional standard from those engaged in contract practice is seen by the provision of the Medical Aid Law, permitting cancellation of these arrangements where unsatisfactory treatment is rendered the injured workmen, and the carte blanche authority of the Supervisor of Industrial Insurance to transfer an injured workman elsewhere for treatment where he deems it advisable so to do.

It is thus apparent that the contract medical and hospital service is closely supervised by the Industrial Insurance Division, and that the State, the employer, and the employees are watching the operation of this type of treatment to see that the highest possible surgical standards are employed therein. Obviously, if satisfactory treatment is not rendered by the surgeon or hospital association, in addition to facing the alternative above mentioned, the dissatisfied workmen and employer are not likely to renew this arrangement upon its expiration.

During the past few years there has been a very noticeable trend towards the contract form of treatment by workmen and employers who had previously operated under the "State Plan." The workmen and employers have observed with alarm and suspicion the increasing medical aid contributions required of them. These rates have increased from 100 to 300 per cent during the thirteen years of operation under the "State Plan," and their joint contributions from 1917 to 1929, when the last figures were available, was the astounding sum of $7,800,000.00, which sum was required for hospital and medical care of injured workmen; while the total amount paid for compensation to the injured workmen since the creation of the Act in 1911 to 1929 was only $48,000,000.00, a truly disproportionate ratio.

So the workmen and employer have taken counsel in the matter in an effort to correct the above seeming discrepancy, and for a remedy have turned to the "Contract Medical Plan," as permitted by the law, in order to avail themselves of a more specialized and economic service. Industrial surgery is one of the more recently specialized fields of medicine, requiring years of study, training and experience. In addition, elaborate and highly specialized equipment is essential for accurate diagnostic and recuperative purposes. Clinics operating under the contract form of treatment invariably have extensive laboratories, x-ray machines, physiotherapy and electrotherapy departments.

The statistics of the Department of Labor and Industries for the year 1929 conclusively established that the standard of medical and surgical skill furnished by surgeons under the "Contract Plan" was superior in results obtained to that furnished by the "State Plan." Let us analyze the cost and medical service rendered to the injured workmen in the saw mill and logging industries for the year 1929. These two classes represent 47 per cent of the volume coming under the Industrial Insurance Act, and are a fair criterion by which to measure the respective merits of the state and contract plans of medical service.

Under the "Contract Plan" of treatment, the average time loss per claim filed in 1929 was 34 days, as against 40 days per claim under the "State Plan." It is obvious that the worker lost six days in wages, and the state paid six additional days compensation on state claims in these two industries. Nor were the results as to permanent partial disabilities any more favorable under the "State Plan." The records show that the degree ratings on permanent partial disability awards cost $60.00 per claim more under the "State Plan" as against the contract medical service.

The figures just quoted indicate that the injured workmen under the "Contract Plan" receive wholesome medical treatment by reason of their speedier recovery, with a lower time loss, and are returned to their work with a lesser functional disability. If this mode of reasoning is carried out to its logical conclusion and applied to the 23,000 time loss injuries that are being annually treated in the State of Washington, there can be a saving of hundreds of thousands of dollars to the industries on time loss and medical treatment.

It is further charged by the Chairman of the Public and Industrial Relations Committee of the King County Medical Society that "under the contract plan, a leg may be amputated to save the hospital expense incident through effort to save the leg." This allegation is wholly without foundation, and persons making such charges are either misinformed or they are deliberately misstating the facts. Such deception can best be answered by figures taken from the annual reports of the Department of Labor and Industries, which are as follows:

Fiscal Year	Accidents Reported	Amputations Hands and arms	Amputations Feet	Amputations Legs	Total Amputations
1912........	6,356	25	8	20	53
1929........	22,876	21	5	22	48

1912—For every 1,000 compensable claims adjusted, 8.3 had amputations of hand, arm, foot or leg.

1929—For every 1,000 compensable claims adjusted, 2.1 had amputations of hand, arm, foot or leg.

From 1917 to 1925 the major portion of the industrial accidents were treated under the "State Plan," and from 1925 to 1929, inclusive, the major percentage of industrial injuries were treated under the "Contract Plan." If this charge on amputations were true, it would most assuredly reflect itself in the figures above quoted. However, such is not the case. The records prove that for the year 1929, with three times the number of cases treated, as against the year 1912 (when the "State Plan" was at its height), the ratio on amputations to claims adjusted was 400 per cent lower.

The above quoted figures probably explain why the industries of the state are more and more demanding the "industrial clinic plan" of treatment, rather than to continue operating under the "state fee schedule plan" to the end that they will pay less money for more efficient medical, surgical and hospital services.

The industrial group type of medical and surgical service, an evolution of this progressive age, is here to stay. It prevails in the highly industrialized East and makes possible those wonderful medical institutions, where so much is being done to further industrial surgery. It makes possible the best available type of medical treatment at a minimum of cost to the injured worker.

Surgeons following the contract plan of treatment do not desire to abolish the state plan of treatment. They believe that the workmen and employer should be allowed to choose the form under which they consider it most favorable to operate.

Chronic Anterior Uveitis. M. N. Beigelman, Los Angeles (*Journal A. M. A.*, Nov. 29, 1930), reports five cases of chronic anterior uveitis in which a thorough examination failed to reveal any other etiology of the uveitis except syphilitic infection. In two cases some foci of infection were found, but their removal had no effect on the course of the uveitis. In view of the wide variety of ocular lesions caused by syphilis, he felt justified in assuming that the uveitis in these cases was also syphilitic in origin; that in all of the cases the general syphilitic infection was of long duration, from fourteen to thirty-two years. One patient presented early signs of tabes; another, those of progressive paralysis. The condition was obviously a late ocular complication in syphilis, quite different from the usual type of acute iridocyclitis in the secondary stage. In four of the five cases specific treatment was administered and, although it was conducted vigorously and for a prolonged period, no improvement could be noticed. Because of that, in two cases nonspecific therapy was resorted to with the most encouraging results. In one case the action of typhoid vaccine was obviously nonspecific. Some further elucidation of its therapeutic aspects seems to be advisable.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

The Principles and Practice of Medicine. Originally Written by the late Sir William Osler. Eleventh Edition. Revised by Thomas McCrae, M.D., Fellow of the Royal College of Physicians, London; Professor of Medicine, Jefferson Medical College, Philadelphia. 1237 pp. Cloth. D. Appleton and Co., New York and London. 1930.

It is now thirty-eight years since Osler gave his incomparable textbook of medicine to the profession. His ability to present the essentials of the description of any disease in a simple and charming literary style has never been equalled in our generation. The amplification of the book as time goes on must be increasingly difficult without destroying the true character of the original in its perfect proportion, style and symmetry. Even in the later editions during Osler's life he found it impossible to keep all the matter of the text in his head and contradicted himself flatly in several parts of the book by insertion of new discoveries that contravened old accepted teachings. It may be readily imagined with what reluctance the editor discards the work of his old master, which has attained almost biblical authority, for the new and possibly later untenable doctrines.

Not long ago the reviewer was asking a colleague if he had ever made a diagnosis of chlorosis, which has always been a part of the classic description of anemias. Whether the marked change in the manner of life of the young female of the species has forever done away with the etiology of chlorosis or not, it has always been to the reviewer a chimera of the textbooks and it is a pleasure to note in the preface that McCrae is inclined to doubt its significance as a clinical entity.

In reviewing the etiology of myocarditis it strikes one that it is an omission to neglect the factor of infections. The various pathologic changes, where any exist in the heart, are noted under etiology of myocarditis but these are often absent and when present are secondary to some primary and often unknown causation. Clinicians of experience recognize the enormous value of removal of focal infections in chronic myocarditis and have seen many recoveries that could be attributed to nothing else. This applies not rarely to cases of angina pectoris.

It has always seemed to the reviewer that a description of chronic cholecystitis is a good criterion of the value of textbooks on practice, this being the most common of all organic digestive disorders. But herein is a most inadequate description and there is no mention whatever of the Graham-Cole method of diagnosis by visualization of the gallbladder. The nonsurgical drainage of Lyon is commended highly in this and other diseases of the bile passages. Most of our knowledge concerning chronic cholecystitis has been gained since Osler's day, and it is but meagerly presented in the latest edition of his work, but the omission of cholecystography in diagnosis is inexcusable.

The difficulties of a formal description of the whole range of medicine in one volume today are much greater than in Osler's time and but one page may be given to a subject that requires a whole volume to do it justice. But the importance of the subject, with especial regard to its frequency as a cause of serious disability, should govern the writer as to the space given its consideration. Thus to allot two pages to chlorosis and one to chronic cholecystitis seems the height of absurdity. As a whole this work represents medicine today as well perhaps as any other confined to one volume, but the present author may not improbably be hampered by his adherence to the Osler of nearly forty years ago. How long will it be possible for one gifted, even as an Osler, to present all medicine satisfactorily within the limit of one volume?

Winslow.

Intestinal Toxemia. (Autointoxication). Biologically Considered. By Anthony Bassler, M.D., F.A.C.P. Consulting Gastroentrologist, St. Vincent's, Peoples' and Jewish Memorial Hospital, etc., New York City. Illustrated with 16 Text Cuts. Cloth, 433 pp., $6.00. F. A. Davis Company, Philadelphia. 1930.

The subject of intestinal toxemia, autointoxication or chronic intestinal toxemia has been one of considerable interest for a great number of years. Its proponents claim it to be a definite disease and the cause of a large variety of complaints, involving any part of the human anatomy. It produces no so-called syndrome but rather a wide range of symptoms. They are vague and varied and do not affect every one alike. Just a few of the symptoms are headache, lassitude, nausea, anemia, loss of appetite, insomnia, irritability, early senile changes and all varieties of intraabdominal complaints.

There is ample authority for the belief that, if intestinal toxemia really exists, it is very much overrated as a cause of symptoms. The author, being positive of the important role played by it, first gives a summary of his own views and then answers those of his critics. There is also to be found an historical review of the early work on this subject by men such as Buchard, Combe, Metchnikoff, Herter and others.

The use of colonic irrigation, the taking of yeast, bulgarian and acidophilus bacillus are considered and their relative merits discussed. Certainly the author is convinced, after twenty years or more of experience and work along this line, that the only method of treatment which offers anything like permanent results is increasing the body immunity against the specific offending organisms that live and propagate in the intestinal tract.

Examination of the feces, urine and blood, and the relation of intestinal toxemia to the various other branches of medicine are dealt with generously. In fact, after ruling out the specific well known diseases, one would be led to believe that nearly every other ailment had its origin in intestinal toxemia. To criticize this worker and his position would presuppose extensive knowledge of this subject after much painstaking experimentation. Certainly, when one looks over the various works by eminent authorities on internal medicine and gastrointestinal diseases and finds so little to be said on this subject, he is hesitant to adopt any extensive method of investigation and treatment such as the author herein suggests. This work does, however, represent the result of the labors of a man who is widely known in his field and who has honestly and diligently searched for the truth on this subject for more than twenty years. For any doctor who is interested this book should be worth careful study. It can be unhesitatingly recommended because it does represent an exhaustive investigation by its author. Manzer.

The Chest in Children. Roentgenologically Considered. Annals of Roentgenology, Vol. XII. By E. Gordon Stotoff, M.D. Assistant in Pediatrics (Assistant Radiologist), Mt. Sinai Hospital, New York, etc. Foreword by Bela Schick, M.D., Pediatrician, Mt. Sinai Hospital. Four Hundred and Six Roentgen-ray Studies and Nineteen Clinical Illustrations. 432 pp. $15. Paul B. Hoeber, Inc., New York, 1930.

This is the most striking and elaborate work that has been published on the chest in children. The illustrations are unsurpassed. Most of the material was obtained from the service of Dr. Schick. There are twenty-eight chapters as follows: Tracheal stenosis, the normal bronchi, bronchitis, bronchial stenosis, bronchiectasis, circulatory disturbances, disturbances of aeration, lobar pneumonia, bronchopneumonia, cysts and tumors of the lungs, pulmonary infiltration of uncommon occurrence, suppurative and necrotic disease of the lungs, pulmonary tuberculosis, acute pleurisy, chronic disease of the pleurae, tuberculous disease of the pleurae, pneumothorax, hydrothorax and hemothorax, anatomy and physiology, mediastinitis, emphysema of the mediastinum, the thyroid, cysts and ganglioneuromata, the thymus, the intrathoracic lymph nodes, the normal diaphragm, elevation of the diaphragm, depression of the diaphragm, peculiarities of the chest wall.

Each chapter is wonderfully illustrated. The correlation of the roentgenographic, pathologic and clinical phases marks this work as a most valuable contribution to pediatrics and roentgenology. Any pediatrician will delight in its possession. C. L. Smith.

Operative Gynecology. By Harry Sturgeon Crossen, M.D., F.A.C.S., Professor of Clinical Gynecology, Washington University School of Medicine, St. Louis, etc. And Robert James Crossen, M.D., Instructor in Clinical Gynecology, Washington University School of Medicine, etc. Fourth Edition. Twelve Hundred Forty-six Illustrations and Two Color Plates. 1078 pp. $15., The C. V. Mosby Co., St. Louis. 1930.

This book is clearly written, giving not only the different procedures for the particular operation but likewise indications and the best technic for the case in question, and emphasizes the necessity of modifying the operation to suit the individual case. The chapter on retroposition of the uterus stresses the increased study being given to patients with this displacement and the conservative treatment now being used. Not every retroposed uterus is causing trouble. Many cases are reported of permanent cures from the use of the pessary after the uterus is brought forward.

In prolapse of the uterus and bladder special mention is made of the necessity of a repair of the relaxed pelvic floor. Cul-de-sac hernia is a newly mentioned feature with its operative treatment. An entirely new chapter is devoted to vesicovaginal and urethrovaginal fistula, a detailed description of the operations to overcome these troublesome conditions being given.

Much space is devoted to trachelorrhaphy and more emphasis is placed on the removal of the chronic irritation of the cervix as prophylaxis against future malignancy. This in itself will tend toward a possible lowering of the present death rate from cancer in this situation. Beside giving the usual and unusual types of operation for the removal of myoma of the uterus, the indications are given for radical treatment. Conservative treatment is not advised, as physicians see but a small number of their myomatous cases to the end. If they did they would be more inclined to early removal while the patient is in good condition, and not when tshe is anemic and having the usual complications of heart and kidney.

Carcinoma of the uterus is covered by the usual radical operations but emphasis is placed on the fact that radium, in addition to its use as a curative measure, has gone far ahead of any other palliative measure in temporarily checking the disease and permitting restoration of the patient's strength. The general plan of treatment giving the best result is a heavy dose of radium followed by deep roentgen rays of penetrating type. In those few cases of early malignancy of either the body or the cervix, operation is advised, preceded by radium and followed by roentgen rays. This gives the patient the best chance of a cure.

Conservative surgery of ovaries and tubes is again mentioned, although nothing new is given. A large chapter on the intestinal tract has been added. This covers obstruction, resection, enterostomy and all the injuries during operations. An additional feature is the work on anesthesia. Helwig.

A Textbook of Physiology. By William H. Howell, Ph.D., M.D., Sc.D., LL.D., Professor of Physiology in the School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Md. Eleventh Edition, Thoroughly Revised. 1099 pages with 308 illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $6.50.

A book that has appeared in eleven editions during twenty-five years must meet a demand. The last edition of this work includes the latest information obtainable in the realm of physiology. The author has endeavored to impress the reader with the information that physiology is a growing subject, continually widening its knowledge and readjusting its theories. The gradual evolution of our present beliefs in physiology has been advanced by experimental work of much more importance than mere theorizing. This volume is divided into nine sections, dealing with the physiology of muscle and nerve, the central nervous system, the special senses, blood and lymph, respiration, digestion and secretion, nutrition and heat production and regulation, reproduction. It is impossible for a reviewer to mention much of the details of technic in a work of this character. As physiology is a basic principle of medical science, every student should obtain as full a knowledge as possible of this subject. Likewise it would be of inestimable value, if every practitioner might at some time refresh his memory as to facts in this important branch of medicine.

Treatment of Epilepsy. By Fritz Talbot, M.D. Clinical Professor of Pediatrics, Harvard University Medical School, etc. 308 pp. $4.00. The Macmillan Company, New York, 1930.

This volume contains a critical review of all the recent medical work and research on the subject of epilepsy. The first section is devoted to history, etiology, pathology, indications and symptoms, and contains little new material on this subject. The second section, however, has to do with the various factors involving the diet, chemistry, metabolism, dehydration, acidosis, the results of fasting, the ketogenic diet and its practical application. Diet in general and dehydration are considered from every angle. The author has given serious consideration to all the different theories of epilepsy and has discussed from every angle the value of the various contributions. In common with many other workers he concludes, "About all that investigation has demonstrated in regard to the connection between epilepsy and the various endocrine glands is that usually there is no relation between the symptom complex and endocrine disorder, and that whenever there is a relation, it is probably secondary and not the cause of the epileptic manifestations."

Probably the outstanding feature of the book is the careful attention paid to diet in the treatment of epilepsy. Under this head the author has considered the various foods, mineral salts of the body, and the effect of a varied diet on the body itself. After summarizing the work that has been done by others he concludes by giving a comprehensive plan for the treatment of these patients by means of variations in the diet. This compiles almost a monograph on dietetics, food values and the relationship of one food to another.

The author does not include surgical measures for relief of epilepsy nor does he believe that at the present time the medical treatment has been solved. Dehydration he has considered rather extensively and some of the most recent work is included in this volume. This book is one that every practitioner who treats epilepsy should have in his library. The material is well cataloged, easily digested and written in comprehensible language. SWIFT.

MINOR SURGERY. By Arthur E. Hertzler, M.D., Chief Surgeon, Halstead Hospital, Kansas, and Victor E. Chesky, M.D., Chief Resident Surgeon, Halstead Hospital. Second Edition. With 475 Illustrations, 602 pp., $10.00. The C. V. Mosby Company, St. Louis, 1930.

What constitutes minor surgery may be a matter of discussion. The author states that the chief stress in this book is based on the recognition of lesions while they are yet minor. The author presents methods used in his clinic which he has found most satisfactory. Pathology of disease is not discussed, since treatment is the main problem presented. There is a discussion of sutures, bandaging, wounds, and blood transfusion. Chapters deal with inflammation and infections, and diseases of the various parts of the body from the scalp to the lower extremities. Being arranged in this systematic manner one can very easily note descriptive treatment in any desired location. The author presents for the most part a single useful method of treatment for each condition rather than an extensive discussion of various methods. There is a profusion of illustrations which are a decided addition to the text.

HISTORIC ARTIFICIAL LIMBS. By Vittorio Putti, M.D., Professor of Orthopedic Surgery, University of Bologna. With Eleven Illustrations. 63 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

Any surgeon interested in the study of artificial limbs will find this monograph interesting reading. Artificial limbs were employed as long ago as the time of Herodotus, nearly 500 B. C. The author gives accounts with illustrations of certain historical artificial hands and arms. Some of these, constructed of metal, were marvelously devised with pulleys and wires for the manipulation of the hands and fingers. Others had fingers fixed at certain angles which rendered them useful for daily work. The style of prosthesis herein described is no longer in vogue, but historically provides an interesting study.

INTERNAL MEDICINE. By Sir Humphrey Rolleston, Bart, G.C.V.O., K.C.B., M.D., Hon. D.Sc., D.C.L., LI.D. Regius Professor of Physic in the University of Cambridge, England. 92 pp., $1.50. Paul B. Hoeber, Inc., New York, 1930.

This little volume is one of the series termed "Clio Medica," which present various phases of the history of medical science. This is not a profound study of the history of medicine but offers brief reviews of certain historical features. Ancient medicine is followed by the survey of Greek medicine, with a chapter on links between Greek and modern medicine. The renaissance period and description of the seventeenth century list the names of medical men who preceded the era of the nineteenth century, which most closely resembles the present period that has witnessed the greatest development in medical history. One can pass a profitable hour or two in reading this interesting monograph.

COMPEND ON BACTERIOLOGY. Including Pathogenic Protozoa. By Robert L. Pitfield, M.D., Attending Physician, Germantown Hospital, Philadelphia, and Howard W. Schaffer, M.D., Pathologist to the Memorial Hospital, Philadelphia, etc. Fifth Edition, with 4 Plates and 82 other Illustrations. 317 pp. $2.00. P. Blakiston's Son & Co., Inc., Philadelphia. 1930.

The series of compends, including many like this, offer briefly the leading points illustrating various branches of medical science. The subject matter is herein presented in as concrete a form as possible. Details of cultures and technic cannot be presented in the limited space. The chapter on immunity is worthy of study, giving in outline the essentially accepted teachings on this subject. This volume is of especial value for the student.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 10, No. 6. INDEX NUMBER. (Philadelphia Number—December, 1930.) 316 pages with 95 illustrations. Per Clinic year (February, 1930, to December, 1930.) Paper 12.00; Cloth $16.00. Philadelphia and London. W. B. Saunders Company, 1930.

This interesting number opens with a clinical lecture by Deaver, the veteran surgeon of Philadelphia. His wide experience with cases of this sort gives especial value to his opinions. He reviews various standard operations and states their applicability to malignances in different parts of the rectum. Jackson and Babcock report seven cases of diverticulosis of the esophagus, successfully treated with the one stage operation. Fay considers the management of intracranial tumors of the posterior fossa and illustrates his procedure by a detailed description of its application to the treatment of five cases. Numerous other surgical conditions are discussed, of interest and value to every surgeon.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month). Volume 14, No. 3. (Mayo Clinic Number, November, 1930). Octavo of 261 pp., with 50 Illustrations. Per Clinic Year, July 1930 to May 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London. W. B. Saunders Company, 1930.

This issue offers many interesting clinical reports which might be expected from the Mayo Clinic. More than

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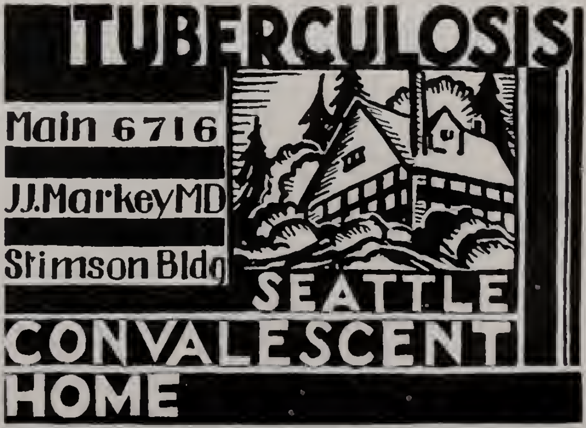

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MIGRAINE. The fifty patients reported on by Clifford J. Barborka, Rochester, Minn. (*Journal A. M. A.*, Dec. 13, 1930), have been on the ketogenic diet from three to thirty-six months. For purposes of study the cases have been tabulated in three groups: (1) those in which the attacks of migraine have been controlled by the ketogenic diet; (2) those in which there has been definite improvement by lessening of the frequency or severity of the attacks, and (3) those in which the treatment failed. The age of the patients varied from 16 to 66 years; the period over which attacks of migraine had occurred varied from four to fifty-four years prior to the time of treatment. Fourteen of the fifty patients controlled the migraine by the use of the ketogenic diet. The cessation of the headaches varied from the time ketosis developed to as long as three months. Most of the patients in this group maintained constant ketosis; a few experienced temporary disappearance of ketosis for a few days. The patients in this group have been on the diet from seven to thirty-six months. Twenty-five patients have been definitely benefited; the attacks of migraine are less common and less severe. Only two patients maintained ketosis; the remainder were periodically in ketosis. The migraine of some of the patients in this group was controlled for the time they were in ketosis, and when they broke the diet, recurrence of the migraine followed. Eleven patients did not derive any benefit from the procedure. These patients made an effort to follow the diet from three to six months. Two patients maintained ketosis constantly, but without influence on the attacks. Four patients were in ketosis periodically, and the remaining patients did not reach the state of ketosis. It should be noted that in the fourteen cases in which the attacks were controlled, diacetic acid, tested for daily, was always present in nine cases, and was present intermittently in five. In the twenty-five cases in which the condition was improved, ketosis was maintained in only two, and in twenty-three it was periodic; the diet apparently produced a state of threshold ketosis. Of the eleven patients who were not benefited, only two maintained the diet accurately and were in a state of ketosis, and this was for four months only; they became discouraged because of not receiving benefit and discontinued the diet. Four of the eleven patients were periodically in ketosis and five did not reach this state at any time.

INCIDENCE OF BROMIDE INTOXICATION AMONG PSYCHOTIC PATIENTS. Since March, 1928, a determination of the bromide content of the blood serum has been a part of the routine in the examination of all patients admitted to the Colorado Psychopathic Hospital. Carl P. Wagner and D. Elizabeth Bunbury, Denver (*Journal A. M. A.*, Dec. 6, 1930), have made a study of the first thousand consecutive cases so examined. Of the thousand cases examined, 7.7 per cent showed bromide in the blood serum in a concentration of 75 mg. per hundred cubic centimeters and over. Of these, thirty-three, or 42.85 per cent, had received the bromide on a physician's prescription; fourteen, or 18 per cent, had taken "patent" medicines; and in thirty, or 38.95 per cent, the source of the drug remained undetermined, but undoubtedly these patients had also taken "patent" medicines, although most of them denied that they had taken medicine of any kind, even when they were confronted with the fact that their illness was due to drug intoxication. In seventeen, or 22.08 per cent, admission to the hospital was sought entirely on account of drug intoxication. Most of these patients recovered before or shortly after leaving the hospital. However, two cases terminated fatally, and in these death was due to the indiscriminate use of bromides only. Both of these patients showed a bromide concentration of over 300 mg. per hundred cubic centimeters of blood. On admission, both had been under the care of a physician and had been taking bromide on prescription. Five other cases terminated fatally. One of these, a patient with dementia paralytica, showed only 75 mg. per hundred cubic centimeters, and the authors do not feel that the bromide contributed toward his death. The four remaining patients, one with cerebrospinal syphilis, one with senile dementia, and two with cerebral arteriosclerosis, died of cardiac decompensation. In these the bromide contributed toward their death in that the excitement due to delirium aggravated the decompensation. The authors assert that undesirable mental symptoms can be reduced to a minimum if the physician will be on the outlook for exacerbation of mental symptoms during bromide administration or if he is willing to make determinations of bromide concentration in the blood. Special care should be exercised in the administration of bromide in cases of organic nervous disorders, particularly those in which the excretory or circulatory functions are impaired.

BACTEREMIA AND ACUTE THROAT INFECTIONS. Howard C. Ballenger and Marie Werner, Chicago, and Mitchell I. Rubin, Baltimore (*Journal A. M. A.*, Dec. 13, 1930), examined a great number of subacute throat infections in some of which secondary manifestations had occurred with the apparent etiologic factor in the throat infection. Ninety-three throat cultures were taken in which the green cocci were found to be the predominating organism in sixty-four instances (about 69 per cent). Streptococcus hemolyticus was obtained in twenty-one cultures (about 23 per cent); staphylococcus albus in six instances (about 7 per cent). Staphylococcus hemolyticus was isolated in two cases. The Klebs-Loeffler bacillus was incidentally found in two throats. Eighty-seven cultures were taken from the nose. The predominating organism found in forty-four instances (about 50 per cent) was staphylococcus albus. This is in marked contrast to the throat cultures, in which this organism occurred in only 6 per cent of the cultures taken. The green cocci were next in order of frequency, occurring in thirty-one instances (about 36 per cent). Streptococcus hemolyticus was found in the nose in ten cultures (about 12 per cent). Staphylococcus aureus and staphylococcus hemolyticus were recovered once each. The throat and nose cultures were taken together in twenty-nine instances. A streptococcus and a staphylococcus were found in about two-thirds of the cultures. The green coccus was isolated in eight instances. Cultures of the mastoids were taken at operation in five cases. Streptococcus hemolyticus was obtained three times, a green coccus and a pneumococcus once each. Cultures taken from the appendix at operation in three cases revealed streptococcus hemolyticus in two instances and a green coccus in one case. Streptococcus hemolyticus was recovered from a profuse ear discharge in the one case in which a culture was taken. Cultures of the spinal fluid in the two cases taken were negative. One hundred and thirty-one blood cultures were taken in sixty-three cases. In four children a positive culture of the blood was obtained. Streptococcus hemolyticus was found in two cases and a green coccus and a pneumococcus in one instance each. In the various complications that may be due to an acute throat infection, streptococcus hemolyticus was found in two-thirds of the cases.

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THE ASCHEIM-ZONDEK PREGNANCY TEST

ANALYSIS OF 150 CASES BY A SIMPLIFIED TECHNIC*

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AND
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Studies of the function of the anterior lobe of the hypophysis, which have been carried on in the last two decades, have gradually lead to the discovery by Ascheim and Zondek that the urine of pregnant women contains a large amount of the gonad stimulating hormone of this gland.

Froelich, in 1901 (quoted from Cushing[1]), first suggested that there was a relationship between the development of the pituitary gland and sexual maturity. Later Cushing, Crow and Homon,[2] Bell,[3] and Aschner and Biedel[1] developed the extirpation technic and demonstrated the striking effect of extirpation of the anterior pituitary in retarding and preventing the development of the sexual glands. Evans and Long,[4] Frank,[5] and Sisson and Broyle[6] were unable to detect any effect upon the sexual organs by feeding the anterior pituitary to rats. However, Engle, Smith, Evans and Long[7] later demonstrated the effect of replacement therapy in animals with extirpated pituitary glands, by injecting extracts of anterior pituitary intraperitoneally. They were able to stimulate the sex glands to renewed but abnormal activity. After injection of the extract into the female, follicular ripening occurred in the ovary but the follicles did not eject the ova. Instead, luteal cells developed about the imprisoned ova, forming what are called corpora atretica. Estrus was first initiated but later suppressed. They concluded that the extract was a specific stimulant to luteal cell growth but that their anterior lobe extract was toxic to ova.

By transplanting anterior pituitary glands into sexually immature female animals or into older animals from which the anterior pituitary had been removed, Smith[8, 9] and Engle[10] were able to produce sexual maturity, that is ovulation, and corpora lutea formation with consequent estrus. In young rats these changes could be brought about as early as the weaning date (twenty-second day of life), if the transplants were made as early as the fourteenth day of life, or much sooner if the transplants were made after the weaning date. Hammond (quoted by Dodds and Dickens[11]) explained the delayed action of the transplants by his theory that the hormone changes its function after a certain amount of growth has taken place from that of a growth stimulating to that of a maturity stimulating hormone.

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* From the Department of Gynecology, University of Oregon Medical School.

1. Cushing, H.: The Pituitary Body and Its Disorders. Philadelphia, Lippincott, 1912.
2. Crow, S. J., Cushing, H. and Homans, J.: Experimental Hypophysectomy. Bull. Johns Hop. Hosp. 21: 127-169. 1910.
3. Bell, W. B.: Experimental Operations on the Pituitary. Quart. J. Exp. Phys. 11:77-126. 1917.
4. Evans, H. M. and Long, J. A.: Effect of the Anterior Lobe Administered Intraperitoneally upon the Growth, Maturity, and Estrous Cycles of the Rat. Anat. Record, 21:62-3. 1921.
5. Frank, R. T.: Influence of Pituitary Extracts on the Genital Tract. J. A. M. A., 73:1764-5. 1919.
6. Sisson, W. R. and Broyles, E. N.: Influence of the Anterior Lobe of the Hypophysis upon the Development of the Albino Rat. Bull. Johns Hop. Hosp., 32: 22-30. 1921.
7. Evans, H. M.: Function of the Anterior Hypophysis. Harvey Lectures, Series XIX, pp. 212-235. 1923-1924.
8. Smith P. E.: Induction of Precocious Sexual Maturity by Pituitary Homeotransplants. Am. J. Phys., 80: 114-125. 1927.
9. Ibid: Hastening Development of Female Genital System by Daily Homoplastic Pituitary Transplants. Proc. Soc. Exper. Biol. and Med., 24:131-132. 1926.
10. Engle, E. T.: Ovarian Responses. J. A. M. A., 93: 276-277. 1929.

Evans and Simpson[12, 13] have recently carried out investigations which would indicate the presence of two hormones in the anterior pituitary, i.e., a growth and a maturity hormone. They state that the growth hormone neutralizes or antagonizes the maturity hormone in the early period of life, and further they have definite evidence which indicates that the maturity or sexual stimulating hormone is produced in the eosinophilic cells of the anterior lobe, while the growth promoting factor is produced in the basophilic cells. Smith and Engle[14] carried out successfully heterotransplant experiments from the guinea pig or rabbit to the mouse with a resulting hastening of sexual maturity. They also produced superovulation by multiple transplants.

Concurrently with the above work Zondek and Ascheim[15] arrived at similar results independently. They transplanted various glands into immature animals in order to answer the question as to whether the ovarian function can be substituted or stimulated by other endocrine glands. They found that transplants of thymus, thyroid, testes, pineal, adrenal cortex or medulla, and posterior lobe of pituitary and other tissues have no effect in bringing ovarian function into action, nor is the estrus exhibited in adult animals by implantation of thymus tissue or extirpation of the adrenals. Only the anterior lobe of the pituitary was shown to have any effect.

Zondek (quoted by Erhenfest[16]) was able to announce one of the most important discoveries in recent endocrine investigation: "The anterior lobe of the pituitary, and no other tissue of the body, produces the hormone which sets in action the latent ovarian function, and thereby brings the infantile animal to sexual maturity." Evans reported similar findings independently. Smith reported that the anterior lobe hormone is a nonspecific sex hormone, that is, it acts upon the male or female generative organs, bringing about development in either case.

Zondek and Ascheim found experimentally that transplantation did not produce any estrus changes when the ovaries were removed previously, and that the ovarian hormone when injected into normal animals does not produce any changes in the ovaries, but apparently only in the uterus and vagina. They concluded from these observations: "The anterior lobe hormone is the motor of sexual function. The anterior lobe hormone is the primary, and the ovarian hormone the secondary. The anterior lobe hormone brings the follicular apparatus into action, fires off the follicular ripening, and mobilizes the secondary ovarian hormone in the follicular cells. This then acts in a specific way on the uterus and vagina."

Erdheim and Stumme (quoted from Cushing), in 1909, reported their findings that certain histologic changes occur in the pituitary gland during pregnancy. The gland increases in size and weight, the whole of the increase being due to changes in the anterior lobe. In Zondek's early work he showed that the blood of pregnant animals always contains large quantities of anterior lobe sex hormone. In 1928, Zondek and Ascheim[17, 18, 19] reported that large amounts of the hormone are found in the urine of the pregnant woman. So much so, that the untreated urine, if injected into infantile mice, produces the identical changes in the ovary, including enlargement, corpora hemorrhagica ("blut punkte") and corpora lutea, which are produced by implantation of anterior lobe tissue. The hormone is present in traces in nonpregnant females and in males, but the amount is very small so that little effect from their urine is obtained. This is the basis for the Ascheim-Zondek pregnancy test.

Ascheim and Zondek[20] first attempted to work out the biologic diagnosis of pregnancy by means of the demonstration of the ovarian hormone in small quantities of urine (½ cc. of urine), but after considerable effort they concluded: "The demonstration of the ovarian hormone in the urine is not suitable for the biologic diagnosis of pregnancy, because this hormone cannot be demonstrated in 1 or 2 cc. of urine earlier than the eighth to tenth week of pregnancy, and then not always with certainty. Moreover, the ovarian hormone may be excreted in large quantities occasionally in nonpregnant women, and in those with functional disturbances, particularly the climacterium."

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[11] Dodds, E. C. and Dickens, F.: Hormones of the Female Reproductive Cycle. J. Obst. and Gyn. Brit. Emp., 36:92-125. 1929.

[12] Evans, H. M. and Simpson, M. F.: Antagonism of Growth and Sex Hormones of the Anterior Hypophysis. J. A. M. A., 91: 1337-1338. 1928.

[13] Ibid: Sex Difference in Hormone Content of Anterior Hypophysis of Rat. Am. J. Phys., 89:375-378. 1929.

[14] Smith, P. E. and Engle, E. T.: Experimental Evidence Regarding the Role of Anterior Pituitary in the Development and Regulation of the Genital System. Am. J. Anat., 40:159-217. 1927.

[15] Zondek, B. and Ascheim, S.: Hypophysenvorderlappen und Ovarium. Beziehungen der endokrinen Drusen zur Ovarialfunktion. Arch. f. Gyneak., 130:1-45. 1927.

[16] Ehrenfest, H.: Ovarian and Hypophyseal Hormones in Urine During Pregnancy. J. Mo. M. A., 26: 113-115. 1929.

[17] Zondek, B.: Das Hormon des Hypophysenvorderlappens Darstellung, chemische Eigenschaften, biologische Wirkingen. Klin. Wchnschr, 7:831-835. 1928.

[18] Ascheim, S. and Zondek, B.: Die Schwangerschaftsdiagnose aus dem Harn durch Nachweis des Hypophysenvorderlappenhormons. I. Grundlagen und technik des Methode. Klin. Wchnschr., 7:1404-1411. 1928.

[19] Ibid: Praktische und theoretische Ergebnisse aus dem Harnuntersuchungen. Klin. Wchnschr, 7:1453-1457. 1928.

[20] Ibid: Hypophysenvorderlappenhormon und Ovarialhormon im Harn von Schwangeren. Klin. Wchnschr, 6:1322. 1927.

During pregnancy, starting within five to six weeks after the last menstrual period and continuing throughout the term until several days after delivery, the anterior pituitary sex hormone is found in the urine in large quantities. Ascheim and Zondek report regarding the quantity of hormones present in the urine: "Within the first and eighth week of pregnancy 1000 cc. of urine contain between 300 and 600 mouse units of ovarian hormone but more than ten times that amount of anterior lobe hormone, namely 5000 to 6000 units. In the last trimester of pregnancy there are in every liter of urine 6000 to 10,000 units of ovarian but only 2000 to 3000 units of the anterior lobe sex hormone."

The technic as used by Ascheim and Zondek for the pregnancy test requires five immature female mice for each test. They state that the mice used must weigh between 6 to 8 gm., as it has been shown that mice reach maturity about the time that they weigh 12 gm., so that mice approaching this weight cannot be used. The urine used for the test should be the morning urine because it contains the hormone in the greatest concentration. The reaction of the urine should be faintly acid. Alkaline urine may be corrected by the addition of a few drops of 2 per cent acetic acid, and all urines should be filtered before being used. If the urine cannot be kept at ice-box temperature or if it is to be kept for several days before being used, it should be treated by the addition of two drops of toluol to 25 cc. of urine. The quantities of urine injected are as follows:

Animal No. 1 six times 0.2 cc.
Animal No. 2 six times 0.25 cc.
Animal No. 3 six times 0.3 cc.
Animal No. 4 six times 0.3 cc.
Animal No. 5 six times 0.4 cc.

They make six subcutaneous injections in each animal over a period of forty-eight hours as follows:

1. Monday A.M., 11:00 to 12:00; P.M. about 5:00.
2. Tuesday A.M., 10:00; P.M. 1:00; P.M. 5:00 to 6:00.
3. Wednesday A.M., 10:00.

The animals are killed and opened for examination at the end of a ninety-six hour period from the first injection of urine. Only the findings in the ovary are to be used in the interpretation of the test. Enlargement of the uterus and a positive vaginal smear cannot be considered as evidence of pregnancy, but only as evidence of ovarian hormone activity, whether it be from the urine injected or the result of stimulation of the ovarian activity by the anterior pituitary hormone.

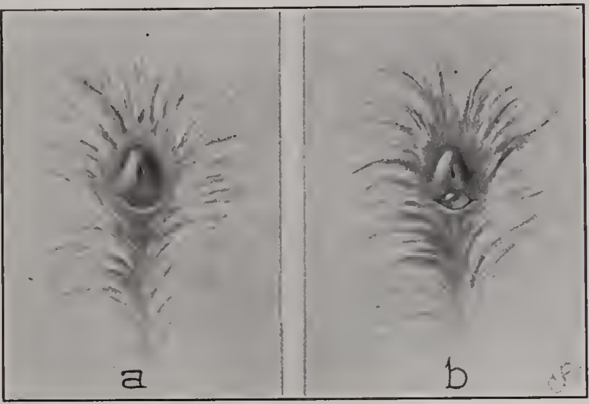

Fig. 1. a. Drawing of imperforate hymen in immature rat before the injection of urine containing the hormones, i.e., urine of pregnant women.
b. This shows a perforate hymen with the secretion projecting through it, one hundred hours after injection of the urine of the pregnant woman.

Ascheim and Zondek consider three reactions in the ovary indicative of the presence of the pituitary sex hormone, or in other words, indicative of a positive pregnancy test. The reactions are:

Reaction No. 1. Maturation of ovarian follicles and the appearance of estrus. The follicles grow in size and become filled with follicular fluid, incidently causing a rather marked enlargement of the ovary. The ovarian hormone is produced by the ripening follicles which in turn brings on estrus, manifested by an enlargement, accumulation of secretion in the uterus, and changes in the vagina with cornification of the superficial cells (figs. 1 and 2).

Reaction No. 2. Petechiae (massive hemorrhage into enlarged follicles). The whole ovary is hyperemic and the vessels are markedly dilated. Most characteristic is massive hemorrhage into enlarged and frequently luteinized follicles. Macroscopically the hemorrhages can be recognized as sharply circumscribed points brown to bluish red in color the size of the head of a pin, projecting above the surface of the ovary.

Reaction No. 3. Luteinization, the formation of corpora lutea and corpora lutea atretica. Under the influence of the hormone of the anterior lobe the theca cells and also partially the granulosa cells become luteinized. The formation of vascularized

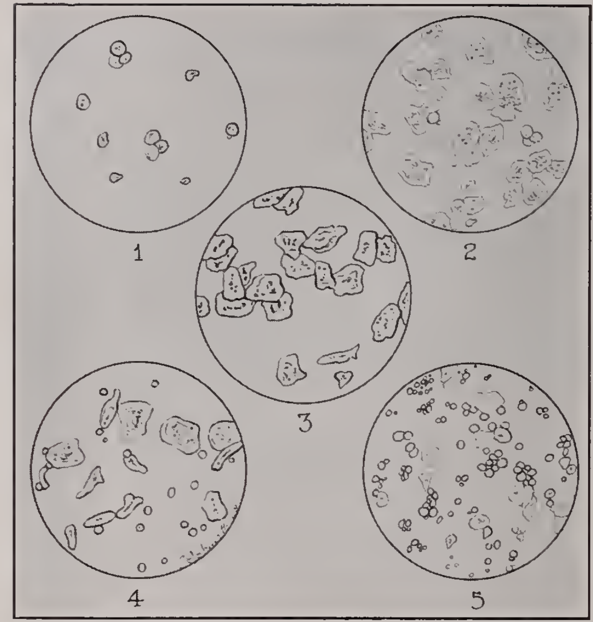

Fig. 2. Stage 1. Preestrus: Before heat begins, no sexual excitement. Vaginal smear shows small epithelial cells with nuclei, no leucocytes.
Stage 2. Estrus: The heat period, copulation accepted. Vaginal smear shows large squamous epithelial cells without nuclei, no leucocytes.
Stage 3. Late estrus. The heat period is over, no sexual excitement. Vaginal smears are thick and cheesy, containing clumps of large squamous cells without nuclei. Late in this stage there may be some large epithelial cells with nuclei; there are no leucocytes.
Stage 4. Metestrus or postestrus. The stage of degeneration and leucotysis. Vaginal smears show moderate numbers of polymorphonuclear leucocytes, squamous cells and large epithelial cells.
Stage 5. Anestrus or diestrus. Pause, the resting stage. The vaginal smear shows polymorphonuclear leucocytes as the predominating cells and moderate numbers of large epithelial cells and strings of mucus.

corpora lutea with the ova retained (corpora lutea atretica) is to be emphasized in particular.

The presence of reactions 2 or 3 or both is indication of a positive test, if present in only one animal. Reaction 1 is strong evidence toward a positive test, but it must be confirmed by the other reactions or the test should be repeated.

After some preliminary work by one of us (Mathieu[21]), we developed a modified method of carrying out the test, requiring only one immature female rat for each test. Only one rat is used because of the difficulty and expense of raising large numbers of female rats, and our results have not indicated that we are decreasing the practical accuracy of the test. As for mice they cannot be obtained in large numbers in this part of the country, and those who have raised them at the University of Oregon Medical School have found them susceptible to many fatal diseases and slow to propagate. Frank,[22] while approving of the test, states that the demand for immature female mice exceeds the available supply.

Our technic is as follows: The urine is filtered and acidified with acetic acid, if it is not already acid in reaction, and then 2-3 drops of toluol are added to each 50 cc. quantity and it is kept in a refrigerator. Only rats weighing between 30 and 65 gm. can be used for the test. The rats should not be younger than twenty-two nor older than forty days. The females do not go into the normal period of puberty until they are seven to eight weeks old, so that forty days is a safe upper limit for premature development of the ovary due to the hormone in the urine. In rats older than forty days the animals are liable to show spontaneous ovarian maturity and give false positive results.

Since it is very desirable that the rats used in the test be normal and rapidly growing animals, they must be given adequate nourishment in utero as well as during early life. The following diet is adequate in the elemental foods as well as in the vitamines:

	Per cent
Cracked corn	40
Cracked wheat	30
Linseed meal	15
Alfalfa meal	3
Casein	5
Brewers' yeast	6
Sodium chloride	0.5
Calcium carbonate	0.5

Viosterol (Mead's) three drops twice each week, and cod liver oil, 1 cc. for each rat once a week. Milk in separate dish for liquid part of diet.

Nursing female rats must be fed well in order to keep the mortality rate among the young at a low mark. The animals should be kept in a room of rather constant temperature because rats are susceptible to snuffles and other respiratory infections.

The urine is injected in 0.5 cc. doses subcutaneously twice a day for three days. The injections should be at least four hours apart. Young rats can easily be injected by lifting the skin on the back of the neck and inserting the needle from the front toward the tail of the animal. In this position the rats cannot easily bite the operator. None of the animals injected in this manner have died during the test. In fact, the rats nearly always gain weight during the period of injection. Ascheim and Zondek report a mortality of over 15 per cent in their mice during the period of injection.*

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[21] Mathieu, A.: Pregnancy Tests. Med. Sent., 37: 623-632. 1929.

[22] Frank, R. T.: Review of the Progress of Endocrinology of Interest to Gynecologist and Obstetrician. Am. J. Obst. Gyn., 20: 215-220. 1930.

* We are indebted to the Department of Physiology, and Asst. Prof. Dr. Ira Mannville of the University of Oregon Medical School, for their valuable assistance in the culture of our rats.

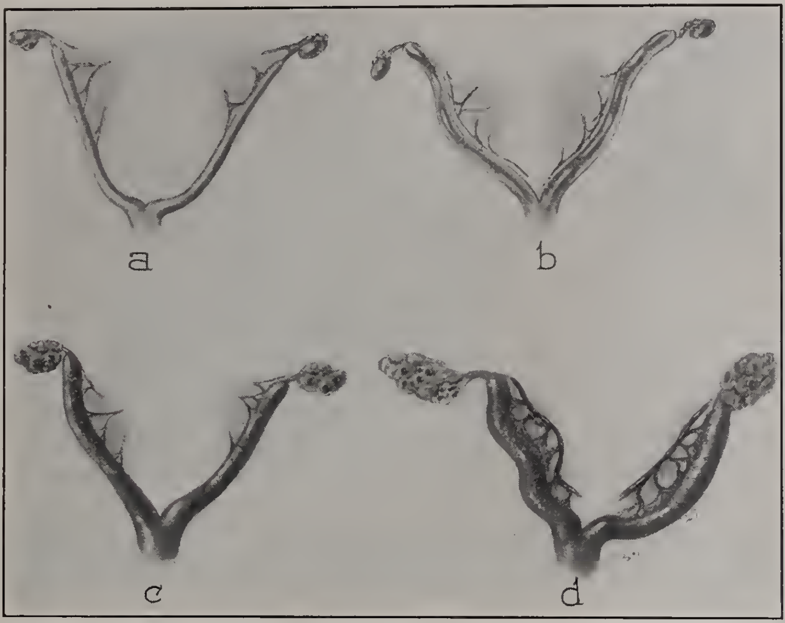

Fig. 3. a. The uterus, tubes and ovaries of the normal immature rat.

b. Uterus, tubes and ovaries of the immature rat following the injection of known nonpregnant urine. Note the somewhat cystic enlargement of the uterus and the absence of ovarian change. This change in the uterus is probably due to the small amount of ovarian hormone in the urine of the known nonpregnant woman. This urine was collected in the post menstrual phase of the nonpregnant woman.

c., d. The uterus, tubes and ovaries of immature rats which were injected with the urine of pregnant women according to the technic of Ascheim and Zondek. Note the engorgement of uterus and tubes and the great enlargement of uterus, tubes and ovaries. The dark spots in the ovaries represent the hemorrhagic areas.

The hymens in a and b were imperforate, while those in c and d were perforate and the vaginal smears showed estrus. These specimens were from rats of the same litter and all of approximately the same weight.

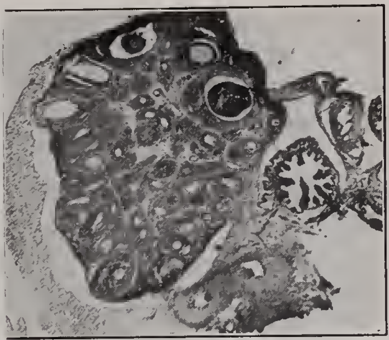

Fig. 4. Shows section of entire ovary of normal immature albino rat weighing approximately 65 grams. Magnified.

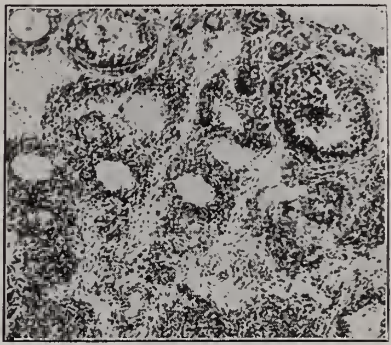

Fig. 5. Microscopic section of a portion of ovary of normal immature albino rat weighing approximately 65 grams. Note the immature follicle in various stages of development with intrafollicular stroma. Compare this with sections from injected rats.

The rats are opened for diagnosis on the fifth day or ninety-six hours after the first injection of urine. The animals are etherized in a jar and fastened to a small operating table for examination. It is best not to kill the animal but rather to anesthetize it. In this way the color and blood supply of the ovary can best be seen (fig. 3). The abdomen is opened widely and after the intestines are pushed aside the cornua of the uterus are seen extending from underneath the bladder upward along the posterior abdominal wall on either side of the aorta, then diverging to pass up to the ovaries, located just below the lower pole of each kidney. A very accurate diagnosis can be made by gross examination.

The same criteria for diagnosis of a positive test are used as were described by Ascheim and Zondek (fig. 4).[†] (1) Maturation of follicles, (2) hyperemia and hemorrhage into follicles, (3) formation of corpora lutea. Reactions 2 and 3 are by far the most important and are required for a diagnosis of pregnancy.

In young rats the hemorrhagic follicles are not often seen, but the hyperemia is marked (figs. 5 and 6). The most common finding in positive cases is the greatly enlarged ovary which is markedly hyperemic. When the ovary is pressed between two glass slides, visible corpora lutea are seen as round opaque bodies within the ovary. For a time we thought it necessary to confirm our gross findings with microscopic sections, but we soon found that gross examination was as accurate as microscopic examination, unless the whole ovary was serial-sectioned, because one section might pass through an unaffected part of the ovary. It is very impractical to depend upon microscopic study because of the time consuming and expensive technic required. We also found it helpful at first to run control rats of the same litter for comparison with the test rats in order to know the appearance of normal rats' ovaries of the same age.

Perforation of the hymen and dilatation of the uterine cornua are signs which indicate the presence of ovarian hormone. These signs are usually present in positive tests but may be present in negative, where the required ovarian changes necessary

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[†] We feel that criteria of Ascheim and Zondek Nos. 1, 2 and 3 should be strictly adhered to in reading the results.

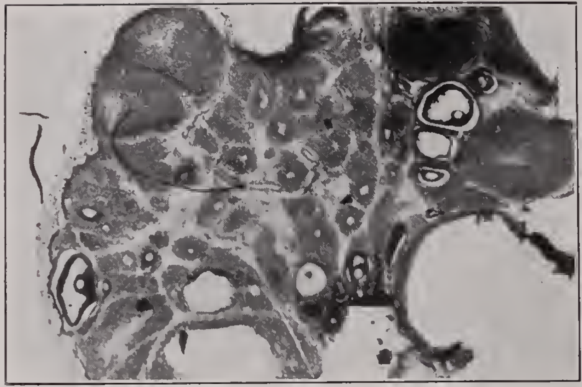

Fig. 6a. Section of the entire ovary of immature albino rat weighing approximately 65 grams, 100 hours after the injection of the urine of a known pregnant woman according to the technic of Ascheim and Zondek. Note the hemorrhagic areas, the graafian follicle with thecal cell formation and the corpora lutea.

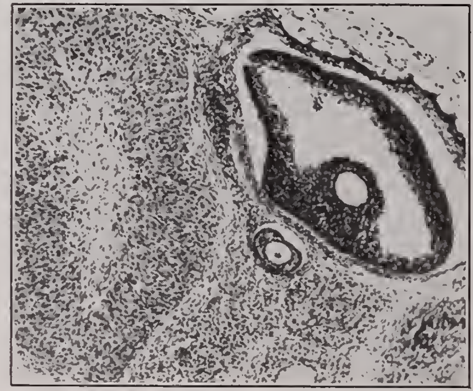

Fig. 6, b.

for a positive Ascheim and Zondek test are not produced. Therefore, opening of the vaginal canal and enlargement of the uterus are only presumptive signs which cannot be used as indication of a positive Ascheim and Zondek reaction.

In one hundred and fifty cases done with the urine of patients, where a differentiation from pregnancy or an early diagnosis of pregnancy was needed, we have checked the test by following the cases to an accurate final diagnosis. Our results are shown on Chart 1.

We do not include the cases listed as unclassified in our percentage of accuracy because they are conditions where we expect the test to give very inaccurate or false results. The reaction is nearly always positive for about eight days, following abortion, miscarriage or parturition. A negative test before forty days after the first day of the last menstrual period is an indication for repetition of the test. We had two such cases shown on Chart 1, on whom the tests were done before the thirty-five day period. Repetition of the test ten days later gave positive reactions.

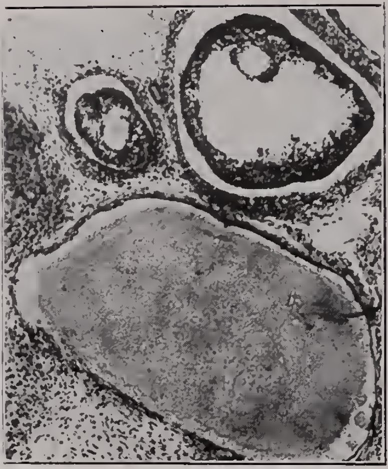

Fig. 6, c.

Figs. 6b and 6c. Higher magnification of portions of 6a. Note hemorrhagic areas and almost completely developed corpus luteum with lutein cells growing inwards; and stimulated follicle with beginning thecal accumulation.

CHART I

ANALYSIS OF 150 CASES TESTED

Clinical diagnosis	No. cases	Reaction Pos.	Reaction Neg.
Pregnancy (more than 35 days after the last menstrual period)	72	71	1
Pregnancy in nursing mothers	2	2	0
Late pregnancy (sixth month to term)	5	5	0
Threatened abortion (hemorrhage but went on to term)	2	2	0
Ruptured	1	1	0
Ectopic pregnancy: unruptured	3	3	0
Total	85	84	1
Nonpregnant:			
Myomata of the uterus	4	0	4
Functional amenorrhea	4	0	4
Carcinoma of the uterus	6	0	6
Menopause	3	0	3
Miscellaneous cases	43	3	40
Total	60	3	57
Unclassified cases illustrating the limitations of the test:			
Seven days after abortion	1	1	0
Fifteen days after abortion	1	0	1
Two days after normal delivery	1	1	0
Very early pregnancy (test done within 35 days after the last menstrual period)	2	0	2
	5	2	3
Grand total	150	98	61

Eliminating the unclassified cases, the percentage of error is 2.7, and accuracy is 97.3.

ANALYSIS OF APPARENT ERRORS

Case 1. This patient came to us forty-two days after her last menstrual period. The test, which was started on this day, was negative. One week later another test was done and it was definitely positive. She is pregnant and appears to be going on to term normally.

Case 2. This patient had not missed a period, but had very severe pain in the left lower abdomen, and on examination there was found a cornification of the cervix and a fluctuating mass in the left side of the pelvis. There was no evidence of pregnancy but the test was positive. She had been married for nine years without pregnancy. The mass in the pelvis was needled through the vagina and pus was obtained. A coloptomy was done and a tube inserted. She was well in three months.

There was no evidence whatsoever of neisserian infection nor any history of trauma or manipulation. The abdomen was not opened. This might have been an infected hematoma of ruptured ectopic pregnancy; we cannot say. The patient has since become pregnant and seems to be going on to term normally. Her Ascheim-Zondek test is now positive.

Case 3. We have no explanation for this error. There was no evidence of pregnancy, even though the test was positive. She was a typus Froehlich, highly neurotic, with very scant menses. She has been seen several times since and is definitely not pregnant. She had a decided increase in sedimentation rate, tenderness in one side of the pelvis, and might have had an ectopic pregnancy. She was not operated on.

Case 4. This patient is definitely not pregnant and the test was positive. We cannot explain this error.

We can think of two possible sources of error in the Ascheim-Zondek test. We feel, of course, that this test might be accompanied by laboratory errors. The urine is gathered, labelled and bottled in one laboratory and sent to another for the test. Herein lie two possible sources of error, and there is still the possibility of error on the part of the technician injecting the urine. The second possible source of error could occur with positive reactions in the following manner: The patient could, after having been told that the Ascheim-Zondek test is positive, have an abortion without our knowing it. It is very possible that Case 4 could come under this heading.

The results above include all of our early cases, where the test fulfilled the requirements which we consider necessary for the accurate diagnosis of pregnancy.

One patient, with multiple myomata seeking operation, gave a positive test and went on to term, proving the value of the test in such cases. Wagner[23] reports a case of cystic myoma in which, even at operation, the enlarged uterus was indistinguishable from that of a pregnancy, but it was removed upon the strength of two negative Ascheim-Zondek tests.

The negative results which we obtained in six cases of carcinoma of the cervix are interesting because Ascheim and Schmidt[24] report occasional positive reactions (reaction No. 1 only) in these cases. In one case of carcinoma of the cervix, in which the woman had received some deep roentgen therapy, there was definite evidence of ovarian hormone activity, that is, the hymen was open, and the uterus dilated and hyperemic in the test rat. This case illustrates the danger of using these evidences of ovarian hormone activity as criteria in the diagnosis of pregnancy.

There have not been any reports of positive reactions in cases of functional amenorrhea, but Fluhmann has reported positive reactions in those cases where he used the blood serum rather than the urine for the test. Fluhmann,[25, 26] has demonstrated occasional positive reactions, where the blood serum is used for the test in cases of total extirpation of the ovary, radiation castration, functional amenorrhea and in irregular menstruation. He does not pretend to use his modification of the Ascheim-Zondek test as a method for the diagnosis of pregnancy, so his findings do not in any way reflect upon the value of the test here described. Ascheim and Zondek carried out the test in 151 cases of functional amenorrhea with negative results in all cases.

The test is almost 100 per cent accurate on cases of early pregnancy, if it is performed ten days after the expected but first missed menstrual period. A negative test in suspected early pregnancy is an indication for repetition of the test.

Ascheim and Zondek[27] have reported that hydatidiform mole and chorioepithelioma cases give a strongly positive reaction to the test. They have suggested that the test be used as an aid in the diagnosis of these growths. In cases where the test remains positive far into the puerperium (longer than eight days after parturition or abortion), these pathologic conditions should be suspected. The test has proven of value in following up cases from which hydatidiform mole has been removed. If the test is still positive two to three months after operation, some of the mole was probably left.

Wagner and others find that repeated positive tests, following the removal of an hydatidiform mole, indicate the need for careful study but do not necessarily indicate chorioepithelioma. However, if the test becomes positive after several negative tests have been obtained, chorioepithelioma should be strongly suspected. He states that the urine from cases of hydatidiform mole gives such a strong positive test, the condition may be differentiated from pregnancy by injection of one-fifth to one-tenth the usual amount of urine to determine the concentration of the pituitary hormone present. If the small amount gives a positive reaction, it is in favor of hydatidiform mole or chorioepithelioma.

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[23] Wagner, G. A.: Erfahrungen mit der hormonalen Schwangerschafts diagnose aus dem Harn nach Ascheim und Zondek. Deutsche med. Wchnschr, 55:2125-2130. 1929.

[24] Schmidt: Ascheim-Zondek Schwangerschaftsreaktion. Deutsche med. Wchnschr., 55:2125-2130. 1929.

[25] Fluhmann, C. F.: Anterior Pituitary Hormone in the Blood of Women with Ovarian Deficiency. J. A. M. A., 93:672-674. 1929.

[26] Ibid: Significance of Anterior Pituitary Hormone in the Blood of Gynecologic Patients. Am. J. Obst. and Gyn., 20:1-15. 1930.

[27] Ascheim, S.: Early Diagnosis of Pregnancy Chorionepithelioma and Hydatidiform Mole by the Ascheim-Zondek Test. Am. J. Obst. and Gyn., 19:335-342. 1930.

In tubal implantation the test is positive as long as the fetal element is not destroyed. Schmidt says that the reaction in his experience is always positive in tubal implantation except in old cases of hematocoele. Radtke claims that the test is positive as long as the fetus is alive. We have examined six urines of suspected ectopic pregnancy cases. In the four cases in which a positive test was obtained operation proved them to be ectopic pregnancies, while in the two negative cases operation showed other pathologic conditions and no ectopic pregnancy.

Ascheim and Zondek have reported that the test gives a positive reaction on women for about eight days after abortion, miscarriage or normal parturition. Kriele[28] reported one case where the test was negative in a "missed abortion" with the uterus about the size of a five months pregnancy. We have carried out the test upon suspected abortion in two cases. These women passed clots and supposed membranes several weeks before the test was done; both gave a positive test and they went on with an otherwise normal pregnancy. These cases suggest that the test may be of value in the diagnosis of missed abortion or death of the fetus. However, we know that the test remains positive for about eight days after the death of the fetus, and in certain cases it evidently remains positive for a much longer time.

Esch[29] thinks that there is too great a lag between the death of the fetus and the time when the test is negative. In one of the cases of a seven months pregnancy the test was done ten days after the fetal heart tones became inaudible; the reaction was positive, but four days later a macerated fetus was expelled. In another case of his the test was positive eight days after the expulsion of the fetus. The study of many more cases will probably clear up this point.

The test is unquestionably of value in differentiating the nausea of vomiting of pregnancy from cholecystitis and other types of gastrointestinal upsets. In one case in our recollection a woman with a history of amenorrhea for six months and chronic cholecystitis was operated on for removal of the gallbladder. She suffered nausea and vomiting and continued to vomit after her operation. She died several days later, and at autopsy the typical liver and kidney damage of toxemia of pregnancy was found with a two and one-half months pregnancy. The Ascheim-Zondek test would have been of distinct help in the case because pregnancy was suspected but apparently ruled out by the size of the uterus as compared with the period of amenorrhea.

CONCLUSIONS

1. The Ascheim-Zondek pregnancy test is a reliable biologic test for early pregnancy.

2. The simplified test which we have developed is essentially the same as the Ascheim-Zondek test, but is carried out in a less elaborate and expensive manner, and is more accessible for use in private practice, and in our hands was 97.3 per cent accurate.

3. The test is of value in the differential diagnosis of early pregnancy, myoma and other uterine tumors, ectopic pregnancy, hydatidiform mole, chorioepithelioma, abortion, toxemia of pregnancy, functional amenorrhea and the menopause.

4. In a study of our first one hundred and fifty cases the results do not show any appreciable loss of accuracy by the modification of the test.

Since this paper was written 100 additional tests have been made with practically the same percentage of accuracy.

The authors are grateful to the Department of Obstetrics, Physiology and Pathology for assistance in this work.

545 Medical Arts Building.

ADENOMYOMA OF THE UTERUS

A CLINICAL AND PATHOLOGIC STUDY *

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Adenomyoma of the uterus was first adequately described pathologically by von Recklinghausen in 1896, but not until the publication of Cullen's[1] classic work in 1908, was the condition given any consideration as a clinical entity. In spite of Cullen's clear description of the pathology and symp-

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28. Kriele: Die Diagnostische Bedeutung der Schwangerschaftsreaction nach Ascheim-Zondek. Deutsche med. Wchnschr., 55: 2125-2130. 1929.

29. Esch: Die Diagnostische Bedeutung der Schwangerschaftsreaction nach Ascheim-Zondek. Deutsche med. Wchnschr., 55:2125-2130. 1929.

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* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

[1] Cullen, T. S.: Adenomyoma of the Uterus W. B. Saunders Co., Philadelphia, 1908.

tomatology, the lesion has remained almost universally unrecognized. Even today it is the consensus of opinion among gynecologists and general surgeons that uterine adenomyoma does not present a diagnostic clinical picture. Most modern textbooks dismiss the subject with a bare description of the pathology and include it with uterine myomata clinically.

That adenomyoma is not a rarity among the numerous diseases of the uterus was first shown by Cullen, who found 73 instances among 1283 cases of myoma, an incidence of about 5.7 per cent. In a single general hospital in Portland, we have discovered 14 examples among 206 hysterectomies for all causes within a period of fifteen months, giving an incidence of 6.79 per cent, which compares favorably with that of Cullen's series.

The present study is not concerned with ectopic endometriosis, about which so much has been written in recent years, particularly by Sampson,[2] and fully reviewed by his colleague Jacobsen[3] in 1928, but will be largely limited to a consideration of the uncomplicated form of adenomyoma occurring within the uterus itself. Suffice it to say that extra-uterine endometrial-like glands and stroma have been found in the rectovaginal septum, the various uterine ligaments, ovaries, fallopian tubes, sigmoid flexure of the colon, umbilicus, pelvic peritoneum and in surgical scars of the abdomen.[4]

It should be mentioned at the outset that adenomyoma of uterus is often complicated by the presence of other pathologic changes, both intrauterine and adnexal. Of the fourteen instances of adenomyoma studied by us, seven were uncomplicated; in four some more obvious pathologic condition such as fibroids was present at the time the patients came to operation, while the remaining three were overshadowed by inflammatory disease in the tubes or ovaries. We have, therefore, divided the uteri into three classes, recognizing that a clinical diagnosis of diffuse adenomyoma is both impossible and unimportant, when overshadowed by other processes which are in themselves an indication for surgery, and clinically it is with the uncomplicated group we are mainly concerned. Cullen long ago showed that uncomplicated adenomyoma presents symptoms and physical findings, which if properly interpreted, should lead to a correct diagnosis.

That rational treatment is not possible without a correct diagnosis which is shown by an analysis of the histories of the cases in this series. Four of the women had been subjected to one or more operations for the relief of their complaint prior to the last admittance, and one case (Mrs. S.) had had four curettements and two pelvic operations over a period of ten years without effect. That the clinical picture of this condition is not generally recognized is further illustrated by the fact that preoperatively the correct diagnosis was made but once in the seven uncomplicated cases. These uteri were removed for such preoperative reasons as fibroids, fibrosis uteri, ovarian cyst and pelvic inflammatory process, in spite of the finding of a normal or moderately enlarged uterus usually of regular contour and an absence of adnexal pathology, where these tissues had not already been removed.

We feel that such errors in diagnosis are largely due to the fact that this condition as a clinical entity has not been properly stressed, and surgeons are groping for a cause to explain a syndrome which is severe enough in its manifestations to warrant surgery. One is impressed by the fact that these cases have not come to operation before from two to fifteen years after the onset of symptoms, although numerous measures had been previously tried to effect a cure, hysterectomy finally solving the problem, usually after a process of gradual surgical elimination of pelvic organs rather than direct diagnosis. It is obvious to all of us that this is an extremely unsatisfactory state of affairs.

The present series of seven uncomplicated cases is not large, but an analysis of clinical symptoms and physical findings discloses a number of interesting and important facts, in general confirming those brought out by Cullen in 1908.

AGE

The age at which women with diffuse adenomyoma of the uterus come to operation is significant. In the group under consideration the youngest patient was thirty-two and the oldest forty-five years at the time of operation. Only four of Cullen's sixty-six cases were less than thirty years of age, the youngest being nineteen. The onset of symptoms in our series dates back from two to fifteen years prior to the operation but rarely began before the age of twenty-five. Although no adequate explanation has been advanced for the quiescent period between the beginning of menstrual function and the onset of this type of dysmenorrhea, it is not unreasonable to suppose that the diffuse myomatous growth in the uterus, which

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[2] Sampson, John A.: Am. J. Obst. and Gynec., 78:2, 1918; Arch. Surg., 5:217, Sept., 1922; S., G. and O., 38:287, 1924; Arch. Surg., 10:1, Jan., 1925; Am. J. Path., 3:93, 1927.

[3] Jacobsen, Victor C.: Ectopic Endometriosis, General Review. Arch. Path., 5:1054-1075, June, 1928.

[4] Cullen, T. S.: Distribution of Adenomyomas Containing Uterine Mucosa. Arch. Surg., 1:215, Sept., 1920.

Cullen believes precedes the outflowing of mucosal glands into the myomatous wall, also takes a number of years for full development.

SYMPTOMS

Pain associated with the menstrual period is the one constant and outstanding complaint of patients with uncomplicated diffuse adenomyoma, and differs in character from the pain of all other uterine conditions uncomplicated by adnexal disease. It may begin one to three days before the commencement of the menstrual flow, usually continues throughout the period without abatement and may not subside for a day or two after the period ceases. The pain is dull and constant in character, most pronounced over the uterus, but also may be referred to the lower part of the back or down the thighs. Cramps associated with this dull ache may occur with the passage of clots, but patients state that there is no complete relief at any time. Many volunteer the information that it differs very much from any dysmenorrhea they may have suffered with before the onset, and is entirely different from the usual cramp-like type occurring in dysmenorrheas associated with adolescence or hyperplasia of the endometrium. Associated with the pain is the frequent complaint of lower abdominal tenderness. An idea of the intensity of the pain is well illustrated by the fact that of the cases under consideration, several women stated that at times hypodermic injections of morphine had been necessary for relief.

When the dysmenorrhea first begins, the menstrual discharge may be normal in amount and the periods as a rule remain regular, but in the majority of instances there is a history of a gradually increasing duration of flow as the condition progresses, so that finally the periods may last ten or even twenty days with only a four or five day interval before the onset of the next period, as occurred in one patient (Mrs. McD.). The flow is usually increased in amount and occasionally small clots are passed. During the intermenstrual phase these women are commonly quite free from any symptoms referable to the pelvis, and an absence of intermenstrual discharge is the rule by reason of the fact that in the majority of these cases the endometrium is normal.

The foregoing discussion of symptoms is well illustrated by two of our cases.

Case 1. Mrs. M. S., 36 years old, was first seen June 24, 1929, with the following complaint:

Severe pelvic pain which began one to three days before the onset of menstruation, dull and constant in character, of maximum intensity over the uterus but radiating through to the back and down the inner sides of the thighs. This pain continues throughout the period without cessation, frequently lasts from one to two days after the period ceases and at times has been severe enough to require morphine for relief. The patient stated that she had always had some cramping at the beginning of her period, but for the last ten to twelve years it had been unbearable. The menstrual flow has been fairly normal in amount and character, but for the last three or four years her periods have increased in duration from four to seven or eight days. They are perfectly regular with a twenty-one day cycle. There has been no backache, pelvic pain or vaginal discharge between periods at any time. She has been married for fourteen years, but has had no children and no miscarriages. The rest of her history was essentially negative except for past operations.

In 1920 she first sought relief for this condition, and was advised to have a dilatation and curettage which was done at that time without relief. In 1921 an exploratory laparotomy was performed, and the left tube and ovary removed, the abdomen being closed without drainage. In 1922 the abdomen was opened and the right tube removed. Curettement was performed again 1924, 1927 and 1928 for the relief of dysmenorrhea without any effect.

The patient was well nourished and general examination was negative except for the following findings:

Pelvic examination. External genitalia negative. Perineum normal. The cervix was normal in appearance, no lacerations or erosions being present, and admitted a probe easily. The uterus was about normal in size and freely movable, its contour being perfectly regular and smooth. The right ovary was palpable and normal in size, no tenderness in region of adnexae. Blood pressure 168 over 104. Hemoglobin 85 per cent. Erythrocytes, 4,800,000. Urine negative.

The patient was kept under observation for about two months. The dysmenorrhea was controlled with codeine only partially, morphine being required at times. The patient was examined during a menstrual period, and it was found that bimanual pressure on the uterus exaggerated the pain. At the end of this time operation was advised, with a preoperative diagnosis of probable diffuse adenomyoma of the uterus.

At operation the uterus was found to be approximately normal in size. The left tube and ovary were absent as was also the right tube. The right ovary appeared normal. Subtotal hysterectomy was performed, convalescence being uneventful. Subsequent course showed complete relief.

Case 6. Mrs. R. P., age 38 years, entered the hospital with the complaint of dysmenorrhea. She stated that her trouble dated back two years. Prior to that time her periods had always been irregular, from four to seven weeks apart, and of four days duration. There had been no pain associated with them. For the last two years she had a dull, steady aching pain in the lower abdomen associated with menstruation, though occasionally prolonged after the period had ceased, and so severe as to require morphine at times. The flow had been diffuse but not increased in duration, with some leucorrhea between periods.

Past history was negative with the following exceptions: The patient had been married twenty years, and had had two miscarriages which she could not explain, followed by a full term stillbirth child. She had been operated upon for a gangrenous appendix in 1908.

Examination was negative with the possible exception of vaginal findings which were not reported on the record. Operation revealed a uterus of normal contour though quite enlarged and weighing 334 grams. Otherwise the pelvis was negative.

PELVIC FINDINGS

If a bimanual examination is made during or very shortly following menstruation, and while the woman is complaining of pain in the lower abdomen, the uterus often appears to be larger than during the intermenstrual phase and is distinctly tender to bimanual pressure.

In uncomplicated diffuse adenomyoma bimanual examination commonly reveals a uterus one to even three or four times the normal size. The outline is usually quite regular and the organ feels much firmer than normal. When enlarged, the contour is frequently globoid or ovoid rather than pear-shaped. Cullen states that very often there are numerous adhesions about the uterus, producing some fixation. In only one of the uncomplicated group of our series was the occurrence noted.

According to Cullen curettage invariably reveals a normal endometrium, thus accounting for the lack of intermenstrual bleeding. In the uncomplicated group we have found this to be true with one exception (Mrs. W. F., case 8), in which the pathologic study revealed a well defined hyperplasia of the endometrium. The clinical data in this case reveal a history fairly typical of adenomyoma, but the patient stated that for several weeks prior to coming to the hospital bleeding had been continuous. This was evidenced by a well developed secondary anemia.

DIAGNOSIS

It will be seen from the foregoing description of symptoms and physical findings that, unless complicated by other conditions, diffuse uterine adenomyoma exhibits a rather typical picture. Painful dysmenorrhea of increasing severity in a woman usually in the third or fourth decade of life, coupled with the finding of a slightly to moderately enlarged but smooth uterus, together with a negative pathologic report on curetted endometrium are important points favoring adenomyoma. It is recognized, of course, that a single intramural fibroid may impart to the uterus a rounded form simulating that produced by adenomyoma. However, the almost constant distortion of the uterine canal, as demonstrated by passing a sound or by lipoidal injection, aid in establishing the presence of such a tumor. Likewise, a large submucous fibroid may cause uterine enlargement but the metrorrhagia commonly associated with such tumors and the ease of their detection by curetting the uterus should not confuse the gynecologist. Acute or chronic pelvic inflammatory disease should not be confusing, as symptoms in adenomyomata are confined to the menstrual period and do not simulate in any way an inflammatory process.

TREATMENT

The question of treatment requires little discussion for the reason that, by the time the patients seek relief for the dysmenorrhea, many are already approaching the end of the child bearing age so that the question of removal of the uterus is not a serious one. Furthermore, a large percentage of the married women in our series have a history of repeated miscarriages or sterility, thus offering proof of an inability to carry out the function of reproduction. Of the seven uncomplicated cases, six were married; one had one child living and well; four gave histories of from one to four miscarriages with no children being carried to term, and one a history of sterility.

The only effective treatment is hysterectomy which gives complete relief from symptoms.

Theoretically radium or deep roentgen-ray therapy in dosages sufficient to render the endometrium inactive should effect a cure, but one must consider the effect of such therapy on the ovaries as well. Also, since some of the adenomatous glands are situated far out in the myometrium, it is questionable whether or not radioactive substances would reach all glands unless given in dosages certain to damage the ovarian function. No statistics are available on this particular point at the present time.

PATHOLOGY

It is generally agreed that adenomyoma within the uterus is of muellerian duct origin. Cullen at first thought that the extensive stretching of the uterus incident to pregnancy might open crevices, through which the mucosa might extend at a later date but he abandoned this viewpoint upon the discovery that the majority of his patients had never been pregnant. Histologic examination gave the impression that the primary factor was a diffuse myomatous growth, involving part or all of the uterine wall.

By means of large tissue sections it was demonstrated that, through the crevices of the coarse muscle bundles of the myoma, single or multiple normal endometrial glands might extend peripherally in all directions, in some instances retaining a connection with the uterine cavity, while others might become closed off and cystic. The occurrence of occasional subserous or submucous adenomyomata was explained on the basis of a migration of pinched-off portions outward or inward. Cullen also observed that adenomyoma may at times be limited to the anterior, posterior or lateral wall of

CHART 1
GROUP I. UNCOMPLICATED ADENOMYOMA

Name and Case No.	Age Yrs.	Chief Complaint	Clinical Diagnosis	Pathologic Diagnosis	Associated Pathology in Uterus and Adnexa	Weight of Uterus	Shape of Uterus
1 Mrs. M. S.	36	Severe Dysmenorrhea with Prolonged flow; 10-12 years duration	Probable Diffuse Adenomyoma of Uterus	Diffuse Adenomyoma	None	80 gm.	Normal
2 Miss M.McG.	33	Marked Dysmenorrhea, necessitating Bed Rest, Menorrhagia	Fibroid Uterus or Ovarian Cyst	Diffuse Adenomyoma	None	150 gm.	Normal
3 Mrs. G. McD.	41	Dysmenorrhea, increasing Menorrhagia for 5-6 years	Fibrosis of Uterus, Retroversion	Diffuse Adenomyoma	None	228 gm.	Spherical
4 Mrs. O. J.	36	Dysmenorrhea and Menorrhagia for 2 Years	Uterine Fibroids, Dysmenorrhea, menorrhagia, Bilat, Salpingitis	Diffuse Adenomyoma	Intramural (Pea-Sized) Fibromyoma of Uterus	40 gm.	....
5 Mrs. H. C.	45	Severe Dysmenorrhea for 1 Year; Lower Abdominal Pain on Exertion	Fibroid Uterus	Diffuse Adenomyoma	None	236 gm.	....
6 Mrs. R. P.	38	Dysmenorrhea and Menorrhagia, 2 Years Duration	Multiple Fibroid Uterus	Diffuse Adenomyoma, Limited to Posterior Wall	None	334 gm.	Spherical
7 Mrs. E. B. J	40	Dysmenorrhea for 1 Year	Uterine Fibroid	Diffuse Adenomyoma, Limited to Posterior Wall	None	200 gm.	Oval

CHART 2
GROUP II. ADENOMYOMA WITH FIBROMYOMATA OR OTHER CHANGES IN UTERUS SUFFICIENTLY MARKED TO PRECLUDE THE POSSIBILITY OF CLINICAL DIAGNOSIS OF ADENOMYOMA

Name and Case No.	Age Yrs.	Weight of Uterus	Shape of Uterus	Clinical Diagnosis	Pathological Diagnosis	Associated Pathology in Uterus and Adnexa
8 Mrs. W. F.	42	255 gm	Oval	Fibroid Uterus	Diffuse Adenomyoma	Hyperplasia of the Endometrium—Chronic Fibrous Perimetritis
9 Mrs. W. N. L.	45	84 gm.	Normal	Prolapse of Uterus	Diffuse Adenomyoma	Prolapse—Bleeding Endometrial and Cervical Polypi—Atrophy of Endometrium
10 Mrs. J. P. H.	42	285 gm	Globoid	Uterine Fibroids	Intramural Adenomyoma	Multiple Intramural, Subserous and Submucous Fibromyomata—Bilateral Luteal Cysts, Ovaries
11 Miss E. W.	43	1050 gm	Irregular Nodular	Fibroid Uterus	Large Pedunculated Subserous Adenomyoma	Multiple Intramural Fibromyomata—Degenerating Luteal Cyst of Ovary

GROUP III. ADENOMYOMA ASSOCIATED WITH INFLAMMATION OF ADNEXA OVERSHADOWING CHANGES IN THE UTERUS AT TIME OF OPERATION

Name and Case No.	Age Yrs.	Weight of Uterus	Shape of Uterus	Clinical Diagnosis	Pathological Diagnosis	Associated Pathology in Uterus and Adnexa
12 Mrs. P. H. B.	38	164 gm	Spherical	Fibroid Uterus	Diffuse Adenomyoma	Unilateral Chronic Salpingo-Oophoritis with Hydrosalpinx—Luteal Cyst of one Ovary
13 Mrs. W. H. W.	32	*245 gm		Pelvic Inflammatory Mass	Diffuse Adenomyoma	Bilateral Subacute Pyosalpingitis Abscess, Left Ovary
14 Mrs. W. H. B.	45	340 gm	Spherical	Fibroid Uterus	Diffuse Adenomyoma Limited to Posterior Walls	Large Tuboovarian Cyst—Hyperplasia of the Endometrium

*With tubes

the uterus. The frequent presence of discrete myomatous masses in uteri exhibiting adenomyoma were regarded as further proof of an underlying myomatous tendency.

Jacobsen holds that simple heterotopy of uterine glands, while exciting a myomatous reaction about them, with a resultant diffuse increase in the size of the organ, does not constitute an adenomyoma but is inclined to sanction the employment of the term by reason of its long usage.

Sampson[5] feels that the name "endometriosis" is more descriptive than any other, since uterine mucosa is the chief source of the lesions.

On a strictly anatomic basis adenomyomata of the uterus have been classified by Cullen as

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[5] Sampson, J. A.: Heterotopic or Misplaced Endometrial Tissue. Am. J. Obst. and Gynec., 10:649, 1925.

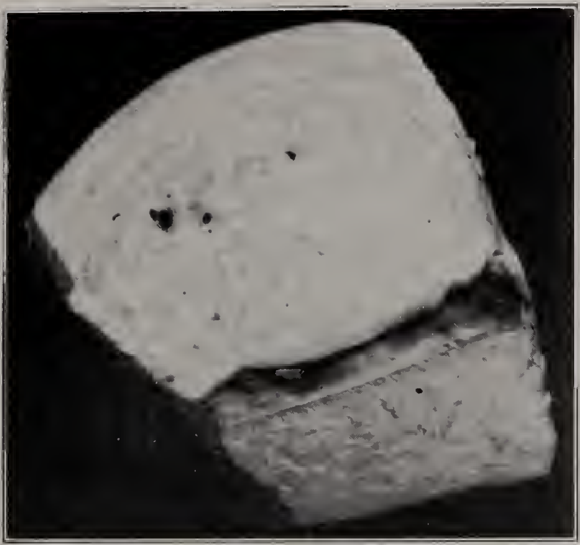

Fig. 1. Sagittal section through fundus of uterus from case 7 (Mrs. E. B. J.). The posterior wall has a thickness of 6 cm., the anterior wall 3 cm. Note the coarse muscle bundles in the broad inner myomatous zone and the outer normal appearing muscle. Several cystic glands filled with old blood are shown well out in the myomatous portion.

(1) diffuse, (2) submucous and (3) subserous. Of fourteen uteri in our series twelve fall in the first group, three being limited to the posterior wall. One occurred in a large pedunculated fibromyoma, while another was situated in an intramural tumor of the same type. In order to better correlate the clinical and pathologic findings we have thought it best to classify the uteri in our series into three groups (charts 1 and 2).

Group I. Uncomplicated adenomyoma. The macroscopic appearances of uteri in this group is so uniform and characteristic that a composite description is sufficient for all.

The contour of the uterus is commonly quite regular and smooth. Of the twelve instances of diffuse adenomyoma three were described as normal in shape, two were oval, four spherical, with the form of three unrecorded. The weight varied from 40 to 340 grams. In only three instances, however, was it less than 100 grams. All others had a weight of 150 grams or over. The increase in size while not great is significant.

The appearance of such a uterus after sectioning is so characteristic that a correct diagnosis may be made from the gross examination alone. According to Cullen a sharp line of demarcation between the outer muscular wall and the diffuse myomatous growth is invariably present, but the two zones are so closely blended that a separation is impossible. In our experience the thickening has been found to be quite diffuse throughout one or both uterine walls in the majority of the uteri.

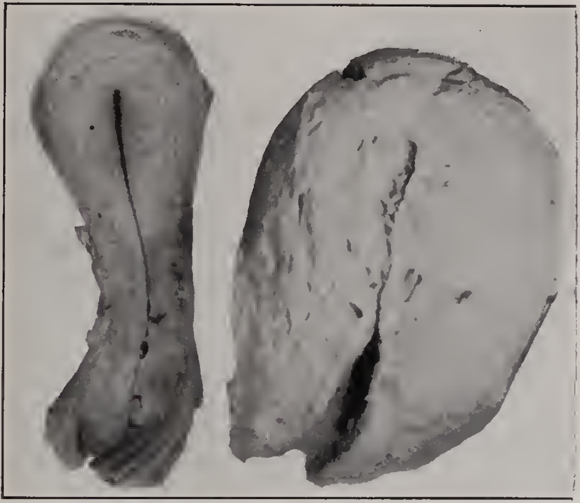

Fig. 2. Sagittal section of uterus from case 8 (right) and of normal uterus of a primipara. The difference in size and appearance of the myometrium is apparent. The pitted depressions are cystic glands.

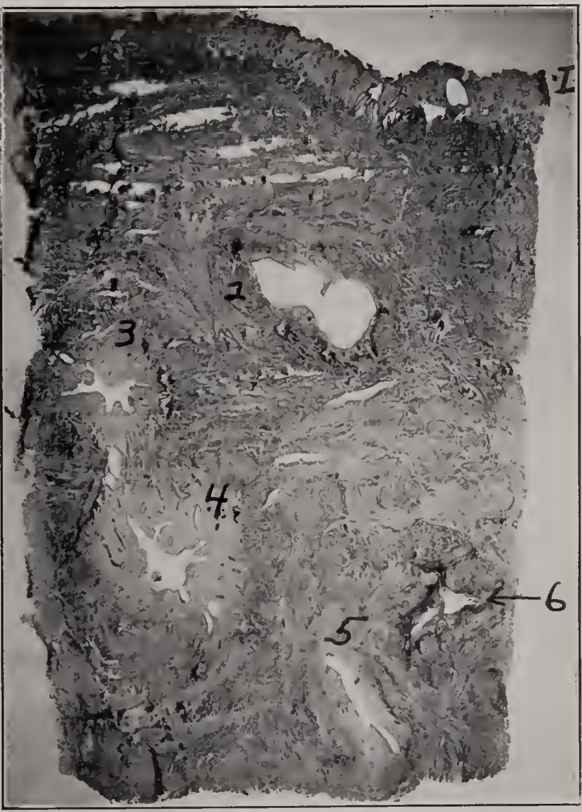

Fig. 3. Very low power microphotograph of entire section from uterus of case 8. 1, hyperplasia of endometrium. 2, large cystic gland flanked by several smaller ones. 3, 4, 5, 6, groups of endometrial glands lying well out in the myometrium.

Case 7 of Group I, however, (fig. 1) illustrates well the point described by Cullen. When such a uterus is sectioned, the margins begin almost immediately to retract and evert to a far greater degree than occurs in a normal organ. The appearance of the cut surfaces is characteristic. The muscle appears quite coarse and interlacing bundles extend in all directions above the level of the surrounding tissue, in which variable numbers of slightly punctiform, soft, pale yellowish areas, barely visible or as large as a pinhead, are situated. In addition it is common to find one or more cystic cavities varying from 1 to 5 or even 10 millimeters in diameter and containing brownish to blackish fluid or pasty material. These represent glands which have been cut off from their connection with the uterine cavity and filled with old menstrual products.

Commonly both walls are equally thickened but when only one is involved, the contrast is very striking. In the three uteri in which only the posterior wall was affected the thickness was 6.0 cm. or exactly twice that of the anterior. Such organs tend to be rounded just as do those in which both walls are involved. The uterine mucosa in all but two instances (cases 8 and 14) was of normal thickness and color. Both were excluded from Group I, Case 8 on account of the histologic finding of hyperplasia of the endometrium, and Case 14 for the same reason and because of obvious disease of the adnexa (figs. 2 and 3).

Group II. Adenomyoma associated with fibromyomata or other pathologic changes in the uterus sufficiently marked to preclude the possibility of a clinical diagnosis of adenomyoma.

Case 9 (Mrs. W. N. L.). The uterus was of normal size and contour but on section exhibited the typical appearance of a diffuse adenomyoma. A large bleeding polypus was found in the fundus and a second much smaller one lay in the cervical canal. The uterus was removed because of procidentia.

Case 10 (Mrs. J. P. H.). Although smooth externally, a number of pea to English walnut-sized, discretely outlined fibroids were encountered when the uterus was cut across. In one of the larger tumors there were a number of pin-point sized cysts filled with brownish fluid. Microscopically these proved to be uterine mucosa with cystic glands containing old blood. The intervening myometrium was quite unchanged.

Case 11 (Miss E. W.). The uterus was much enlarged, weighing 1050 grams, and externally appeared quite nodular. Projecting from the posterior surface was a single pedunculated tumor measuring 8 by 11 cm., the cut surfaces of which appeared like an ordinary fibroid except near one margin, where two irregular cavities filled with blackish tarry material were situated. The larger of these measured 2 by 4 cm. The lining of both cysts had a trabeculated appearance and a yellowish color like that of hemosiderin. In microscopic sections the cysts were found to have a lining of uterine glands and stroma, in which many phagocytic cells, laden with granular yellowish pigment, were present. The two intramural tumors had a maximum diameter of 5 and 7 cm. respectively.

Group II. Adenomyoma associated with inflammation of adnexa, overshadowing changes in the uterus at the time of operation.

The three uteri in this group presented the typical picture of diffuse adenomyoma as described in Group I, but have been classed separately on account of the very evident disease of the adnexa responsible for the clinical symptoms of the patients.

MICROSCOPIC

A pathologic diagnosis of adenomyoma of the uterus is permissible only when typical uterine glands surrounded by characteristic stromal cells are found either in the myometrium or in discrete myomata within the organ or connected with it. The possibility of inclusions of normal endometrium, especially in the region of the cornua, must be kept constantly in mind in the cutting of blocks for sectioning. We have been most careful in this respect and in the diffuse growths selected blocks from points well out in the musculature.

The glands within the myometrium or in myomata may be single or multiple, small or large. Oftentimes a large and dilated gland will be surrounded by a rosette of smaller ones. Commonly there is little tendency to coiling but it does exist. All glands, whatever their size, are lined by tall columnar epithelium. The latter commonly contain remnants of erythrocytes, hematoidin, hemosiderin blood pigment and cellular debris. Surrounding the glands are closely or loosely arranged dark staining spindle-shaped stromal cells, among which pigment-laden phagocytic cells are often found, especially about those which have undergone cystic changes. The smooth muscle cells about the involved areas are almost invariably hyperplastic and hypertrophic.

With the exception of Cases 8 and 14 the endometrium exhibited nothing of importance. In both instances the endometrium showed the type of hyperplasia described by Novak and Martzloff.[5]

Cullen has said that the endometrium in adenomyoma is invariably normal, but the statement was

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6. Novak, Emil and Martzloff, K. H.: Hyperplasia of the Endometrium. Am. J. Obst. and Gynec., 8:385-411, Oct., 1924.

made several years prior to the appearance of Novak and Martzloff's publication.

SUMMARY

Recognized as a pathologic entity as early as 1895 and fully described both clinically and pathologically by Cullen in 1908, the importance and comparative frequency of adenomyoma of the uterus is not yet properly appreciated. In a single general hospital the writers have encountered 14 instances in a series of 206 hysterectomies for all causes, an incidence of 6.79 per cent.

Not infrequently the condition is obscured by the presence of concomitant discrete fibromyomata in the uterus or disease processes in the adnexa, but in our series fifty per cent of the uteri showed uncomplicated diffuse adenomyoma. Patients with this form commonly suffer from severe dysmenorrhea which is practically always attributed to some other cause, such as fibroids or endocrine dysfunction. In such cases an accurate history and careful pelvic examination, together with negative pathologic findings in curetted material, should establish the correct diagnosis, lead to rational treatment, and eliminate needless operations.

AVERTIN

(TRIBROMETHYLALCOHOL)

ANESTHESIA AND ANALGESIA IN OBSTRETRICS BY ITS RECTAL ADMINISTRATION

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There is a saying, "To please the gods, one needs but please the ladies." By ladies here is meant the wives, the daughters, the mothers and sisters of men. The conscientious and sympathetic obstetrician may not be concerned with pleasing the gods, but is content with the earthly reward, the gratification which comes as a result of the eradication of tocophobia in wives of men and mothers of men to be, and their sincere thankfulness for his attempts, as Potter states, to "shorten their 'hour,' lessen their 'anguish' and complete their 'joy'." Ever since the discovery of chloroform he has tried and used the multiple methods which have aimed at the elimination of pain at parturition. It is fair to state, I believe, that, used by the profession at large, all have been found lacking in some respect, and the obstetrician has with few exceptions found most of them inadequate. They have been found wanting in the matter of efficiency, cumbersomness and administration; they have been a source of danger to both mother and child, have often caused local irritation with resulting chronic disorders, and with none of them could the obstetrician promise his patient, long before delivery, absolute relief from pain at that feared, that dreaded labor through which she must inevitably pass.

Though one is prone to become enthusiastic too readily wherein a new drug is concerned, and though twenty-five cases represent a small number, nevertheless the use of avertin (tribromethylalcohol) in these cases has resulted in almost identical findings, all of which have been long sought by those interested in relieving pain at childbirth. One needs but read the first case report given below to learn what happens when avertin is given to a parturient woman. The action of the drug is always the same; there are no factors which enter in to alter this action except the amount given per kilo body weight. Even this is proportionately constant.

HISTORY

Avertin was first made by Willstatter and Duisberg in Germany in 1926, and was introduced into practice by Eichholtz after his pharmacologic investigations. Dale, Hughes, Morrin and deCaux of the Section of Anesthetics of the Royal Society of Medicine in England and investigators in other European countries used the drug and reported their findings in numerous articles. Two years after its introduction abroad, avertin was placed at the disposal of anesthetists in this country, and the results of the tests applied have corroborated in all essential respects the favorable experiences of European clinicians.

PROPERTIES

Chemically, avertin is tribromethanol (CBr_3CH_2OH), a white, crystalline powder, soluble in water at 104° F. up to 3.5 per cent. It decomposes in light and air. Avertin fluid (the only available form) is a solution of avertin in amylene hydroxide, 1 cc. of which contains 1 gm. of the drug. Amylene hydroxide is very volatile and inflammable (but not explosive). The bottles of avertin fluid are kept tightly stoppered and not exposed to an open flame. The advantages of amylene hydroxide are that is dissolves avertin in high concentration and is itself readily soluble in water, besides exerting some hypnotic action and stimulation of respiration when absorbed by the living animal body. Avertin fluid when dissolved in water under proper conditions is quite stable. If allowed to cool, avertin crystallizes out, and if heated much above 104° F. decomposition takes place, hydrobromic acid being split off and dibromacetaldehyde is formed. The latter is very irritating to and may even produce necrosis of the intestinal mucous membrane. It is detected through the use of Congo red in aqueous solution of 1:1000, a drop or two of which added to a solution of avertin fluid produces a blue or violet color.

PHARMOCOLOGY

Absorption. Avertin is absorbed by the rectal mucosa more rapidly than water, in which it is dissolved and consequently the avertin content of the injected solution undergoes rapid decrease. During anesthesia the concentration of avertin in the blood is 6 to 9 mg. per cent.

Elimination. Avertin is eliminated by the way of the liver and kidneys and in the combination of glycuronic acid. As high as 81 per cent of the drug has been recovered from the urine within forty-eight hours. Traces of bromine have been found in the perspiration, but most of it (72 per cent) is excreted in the urine.

Toxicity. Because of the fact that avertin is absorbed so rapidly, sleep is produced shortly after rectal administration. No preliminary stage of excitement is brought about, and awakening is like out of a natural sleep. There is no injury to the intestinal mucosa. The respirations are decreased. The respiratory center is readily influenced but the margin of safety is relatively great. The toxicity for the cardiac musculature is very low, being about one-sixteenth that of chloroform. The blood pressure may fall as much as 30 mm. mercury but usually no change is noted. Experimentally, large doses of avertin administered daily to animals caused no injury to any of the internal organs. The safety in rectal administration lies in the 70 per cent difference between the minimal narcotic and the lethal dose.

Germicidal effects. Avertin destroys colon bacilli and staphylococci in one minute in a 3 per cent solution in vitro.

Anesthetic action. Humans lie quietly while the rectal administration of avertin is begun. Then, after three to five minutes they remark that they are sleepy or sigh deeply and assume a comfortable position, and in another three minutes are sleeping soundly and do not respond to questions. The experimental rabbit remains seated after the administration of the drug. Shortly the head drops and the rest of the body follows slowly, and soon afterwards the animal is in a state of deep narcosis.

CLINICAL OBSERVATIONS

Effects of injection. Within three to five minutes after the beginning of the administration of avertin rectally, the patient in labor begins to feel sleepy and in another five minutes is in a deep sleep, from which she cannot be aroused by the spoken voice. It is noted that the respirations decrease in rate but are increased in depth. The pulse remains the same. The color does not change. There is no excitement. Muscular relaxation is complete except for uterine contractions which continue at regular intervals. When these occur, the patient usually grimaces, moves her legs and arms, her face becomes flushed and she may murmur an incoherent sentence, but as soon as the contraction has subsided, she again sinks into oblivion. If the jaw and tongue are much relaxed, there may be stertor which disappears with reopening of the airway. The blood pressure may fall from 10 to 30 mm. mercury soon after administration of the anesthetic but quickly maintains its normal level, the diastolic pressure remaining constant.

Varying from one and one-half to two hours usually, the effects of the drug have worn off, and the patient in active labor, although drowsy, nevertheless again is conscious of actual pain with each contraction. If delivery has taken place, she sleeps for from two or three hours to a whole day. Now, however, she is sleeping lightly, the corneal reflex is brisk as is that of the larynx, the importance of this being that the patient does not have to be watched so closely during this postanesthesia period to prevent aspiration of foreign material. Finally, she awakens from a natural sleep, is rested, has no nausea and has little or no memory of the events which took place after the administration of the drug. Soon she is talking normally, asks to see her baby, partakes of food and, insofar as the anesthetic is concerned, goes on through the puerperium uneventfully. There have been no injections of irritating substances into her muscles, no irritation in the anal canal, no disagreeable odors, nothing obnoxious and nothing dangerous administered. Too, labor is not prolonged.

The fetal heart is not changed in rate or rhythm. All babies cry and breathe spontaneously on being born. In two of my cases there has been a very slight blueness which cleared up almost at once.

Indications. Avertin may be administered (1) to a primipara who is nervous and anxious and whose pains are becoming quite severe with little progress, (2) to all patients experiencing a dry labor, (3) to those with occipitoposterior varieties, (4) to all who are complaining of severe pain at any stage of labor and (5) to all who will deliver within an hour and a half.

Contraindications. Avertin should not be administered to (1) cases wherein there is organic disease of the liver or kidneys, (2) acidosis, (3) severe blood diseases and (4) grave cachexia.

Dosage. If a preliminary hypodermic injection of morphine described below is given at the beginning of the first stage of labor, then 60 mg. avertin per kilo body weight is sufficient. Otherwise, 80 mg. is much more satisfactory. It is to be remembered, of course, that the drug may be repeated in two to four hours, depending upon the amount of analgesia and amnesia. Following are the dosage tables as compiled by the manufacturers of the drug in this country (The Winthrop Chemical Company, New York City):

Preparation of solution. Avertin fluid is retailed in 100 cc. bottles along with a small amount of Congo red solution. The directions should be followed to the letter to prevent ill effects. Particularly, it must be remembered that the distilled water to which the avertin fluid is added must not be above 104° F. (40° C.) because, as stated above, extremely irritating substances are formed, which may injure the patient permanently. I would suggest that the attending obstetrician prepare the solution himself and administer it also until such a time when it may be turned over to an assistant or graduate nurse. In this way he will be able to study its effects first hand.

The following technic is used at Tacoma General Hospital in our maternity department:

1. The proper amount of avertin fluid is measured out into a graduate.

DOSAGE TABLE NO. 1
BASIS: 80 Milligrams per Kilogram of Body Weight

*Patient's Weight**		*Avertin Fluid* Amount in cc's	*Water†* Amount Pounds	*Patient's Weight**		*Avertin Fluid* Amount in cc's	*Water†* Amount in cc's
Pounds	Kilos			Pounds	Kilos		
22	10	0.8	32	123	56	4.5	180
26	12	1.0	40	128	58	4.6	184
31	14	1.1	44	132	60	4.8	192
35	16	1.3	52	136	62	5.0	200
40	18	1.4	56	141	64	5.1	204
44	20	1.6	64	145	66	5.3	212
48	22	1.8	72	150	68	5.4	216
53	24	1.9	76	154	70	5.6	224
57	26	2.1	84	158	72	5.8	232
62	28	2.2	88	163	74	5.9	236
66	30	2.4	96	167	76	6.1	244
70	32	2.6	104	172	78	6.2	248
75	34	2.7	108	176	80	6.4	256
79	36	2.9	116	180	82	6.6	264
84	38	3.0	120	185	84	6.7	268
88	40	3.2	128	189	86	6.9	276
92	42	3.4	136	194	88	7.0	280
97	44	3.5	140	198	90	7.2	288
101	46	3.7	148	202	92	7.4	296
106	48	3.8	152	207	94	7.5	300
110	50	4.0	160	211	96	7.7	308
114	52	4.2	168	216	98	7.8	312
119	54	4.3	172	220	100	8.0	320

*If the weight is intermediate between two figures given in these columns, use either the nearest lower dose, or the average of the neares ower and higher doses. Thus, for a patient of 152 pounds, the dosage (based on 100 mg.) may be 6.8 or 6.9 cc.

†Use only distilled water.

DOSAGE TABLE NO. 2
BASIS: 60 Milligrams per Kilogram of Body Weight

*Patient's Weight**		*Avertin Fluid* Amount in cc's	*Water†* Amount in cc's	*Patient's Weight**		*Avertin Fluid* Amount in cc's	*Water†* Amount in cc's
Pounds	Kilos			Pounds	Kilos		
22	10	0.6	24	123	56	3.4	136
26	12	0.7	28	128	58	3.5	140
31	14	0.8	32	132	60	3.6	144
35	16	1.0	40	136	62	3.7	148
40	18	1.1	44	141	64	3.8	152
44	20	1.2	48	145	66	4.0	160
48	22	1.3	52	150	68	4.1	164
53	24	1.4	56	154	70	4.2	168
57	26	1.6	64	158	72	4.3	172
62	28	1.7	68	163	74	4.4	176
66	30	1.8	72	167	76	4.6	184
70	32	1.9	76	172	78	4.7	188
75	34	2.0	80	176	80	4.8	192
79	36	2.2	88	180	82	4.9	196
84	38	2.3	92	185	84	5.0	200
88	40	2.4	96	189	86	5.2	208
92	42	2.5	100	194	88	5.3	212
97	44	2.6	104	198	90	5.4	216
101	46	2.8	112	202	92	5.5	220
106	48	2.9	116	207	94	5.6	224
110	50	3.0	120	211	96	5.8	232
114	52	3.1	124	216	98	5.9	236
119	54	3.2	128	220	100	6.0	240

*If the weight is intermediate between two figures given in these columns, use either the nearest dose, or the average of the nearest lower and higher doses. Thus, for a patient of 152 pounds, the dosage (based on 100 mg.) may be 6.8 or 6.9 cc.

†Use only distilled water.

2. The proper amount of distilled water is measured into an Erlenmeyer flask (500 cc.) and the latter placed in a few inches of water on the bottom of the steam sterilizer, the steam turned on and the water heated to 40° C., using a centigrade thermometer.

3. Being certain that the distilled water has not heated to more than 40° C., add the avertin fluid to it. Stopper the flask, and shake well until all of the globules have disappeared.

4. Do not permit the solution to cool.

5. Pour two cc. of the solution you have just prepared into a small graduate and add one or two drops of Congo red aqueous solution 1:1000. If a pure orange-red color results, the solution may be injected at once. If a blue or violet color results, the solution should be discarded as it has been decomposed and is, therefore, dangerous. This test is a reliable safeguard only if distilled water has been used. Tap water should never be used.

Administration per rectum. Using a glass funnel and a well lubricated male catheter which is inserted quite high in the anal canal, the avertin solution is allowed to run in by gravity, or it may be injected at a moderate rate of flow, attaching a large syringe to the distal end of the catheter.

Precautions to be taken. When the patient is in active labor, it is important that an enema be given fifteen minutes before the administration of the solution. This empties the lower bowel of all fecal material which may be expelled along with most of the avertin fluid during a uterine contraction before complete absorption has taken place. Then it is well to compress the buttocks for at least ten minutes after the fluid has been given. Also, while giving the drug, caution the patient against expelling the fluid, if a labor pain ensues before you have completed the injection.

Time of administration. Martin believes that the preliminary preparation of the patient is especially important. He gives a hypodermic of morphine, ⅛ grain in 2 cc. of magnesium sulphate 50 per cent, novocaine 2.5 per cent. In my series this has not been done as he does, at the beginning of the first stage of labor, because of an antipathy toward the injection of irritating and painful substances intramuscularly. Rather, I give the avertin solution when the patient is complaining, when she is tired or when I feel that she will complete the second stage of labor in two hours.

Ideally, the avertin solution should be given about one and one-fourth hours before the anticipated delivery. The fetal head is below the pelvic brim and the cervix is fully dilated at the time of administration. It may become necessary to repeat the injection where delivery does not take place as soon as expected.

Observation after administration. It is well to watch the patient's progress carefully after giving avertin. Not one of my patients required restraint as there was no excitement, but several of them delivered much more quickly than was anticipated. A certain amount of relaxation brought about by avertin may account for a more rapid descent of the fetus through the birth canal.

Second stage of labor. In most of the cases in this series it was necessary to give a small amount of gas during the second stage. In two of the cases the patients delivered spontaneously and later had no recollection of ever being in the delivery room. In two other cases low forceps were applied after first ironing out the perineum manually. In these four cases no gas was used whatever. In the cases wherein a version and extraction were done, it was necessary to give very little ether along with the ethylene.

CONCLUSIONS

1. In avertin the obstetrician has a powerful analgesic and anesthetic, with which he can promise his patient freedom from pain at childbirth.

2. The drug is not dangerous to either mother or fetus, is easily prepared and administered and is constant in its action in practically every case.

3. It is germicidal in its action and is, therefore, of value in the prophylaxis of puerperal sepsis.

4. It is contraindicated in organic disease of the liver and kidneys, acidosis, anemias and grave cachexia.

5. It is indicated at any time during labor (provided mother and fetus are in good condition), when the patient is complaining of unbearable pain. It is especially indicated in primiparae, where the pain is very severe, with little or no progress, and in all cases of dry labor.

6. Precautions should be taken in the preparation of the avertin solution, the directions being followed to the letter, and in the proper preparation of the lower bowel of the patient.

CASE REPORTS

Case 1. Mrs. F. W. Para-III, 128 lbs. Avertin fluid, 4.6 cc. Water, 184 cc.

Patient was experiencing a dry labor. She had been in labor for three hours with pains every three to four minutes with no progress. At the end of this time she was cry-ing out with each pain. The above dosage of avertin was given at 1:00 p.m. and the patient slept from that time until 4:00 p.m. During this period her pains continued to occur every four to five minutes. The fetal heart showed a slight depression in rate just after giving the avertin, but the blood pressure of the mother showed no change. At 4:00 p.m. the cervix was fully dilated and the fetal head was well down on the perineum. The patient was taken to the delivery room, a small amount of gas given and the fetus extracted by a low forceps application. An apparently normal male child was born, cried and breathed spontaneously at once. The patient barely remembers being taken to the birth room, remembers nothing after the administration of the drug per rectum until just before delivery, slept for six hours after delivery and both she and the baby made an uneventful recovery.

Case 2. Mrs. J. P. Para-III, 220 lbs. Avertin fluid, 8 cc. Water 320 cc.

Patient induced at term by insertion of Barnes' bag because of history of going a month past term and she had lost second child. Good pains brought about. Bag expelled and pains stopped. Membranes ruptured artificially and patient went into active labor. Three hours of labor found her quite tired and complaining of each pain. Cervix still quite hard and fetal head high. The above dose of avertin given at 3:15 p.m. Patient was asleep in six or eight minutes and slept soundly until 7:30 p.m., labor pains going on rhythmically every three to five minutes. Blood pressure of mother, her color or pulse and the fetal heart were all unchanged. Patient began to squirm around in bed with each pain at 7:30 p.m. and at 8:30 was complaining of her pains. The cervix was fully dilated at this time and the head upon the perineum. A normal, male infant was born normally at 9:00 p.m., was slightly cyanotic but cried lustily and breathed spontaneously. No inhalation anesthesia was administered to the mother. She did not awaken after being placed in her room, until 4:00 a.m. and remembered absolutely nothing of her pains or complaining after the administration of the avertin. Uneventful recovery of both mother and child.

Case 3. Mrs. D. S. Para-I, 132 lbs. Avertin fluid, 4.8 cc. Water, 192 cc.

Patient's membranes ruptured at 6:00 a.m. Her pains were not severe until 10:30 a.m., when she began to complain. Cervix admitted only two fingers; fetal head still quite high in a very flat pelvis. Above dosage of avertin given. Patient went to sleep at once, uterine contractions occurring every three to five minutes. She moved about, wrinkled up her face and placed her hands upon her abdomen with each pain. She was taken to the birth room at 12:00 and under light gas anesthesia delivered by low forceps extraction of a female infant which was also normal in all its reactions. Mother does not remember being taken to delivery room, and has no memory of pain after the avertin was given.

Case 4. Mrs. T. J. M., Para-I, 150 lbs. Avertin, 5.4 cc. Water, 216 cc.

Patient to be cesarianized at 8:00 a.m. At 7:35 a.m. she was given the above dosage of avertin by rectum. She developed slight cramps in her lower abdomen, but retained the fluid by rectum and was sound asleep in a very short time. She was taken to the surgery, but remembers nothing of being moved from her bed to the cart. C_2H_6 anesthesia.

The baby breathed and cried immediately upon birth. Gained normally during stay in hospital. Mother made an uneventful recovery; home on fourteenth day.

Case 5. Mrs. H. W. R., Para-I, 158 lbs. Avertin fluid, 5.8 Water, 232 cc.

Patient entered hospital at 4:00 p.m., having pains only every fifteen minutes. At 8:00 p.m. uterine pains were occurring every five minutes but were not severe. At 11:00 p.m. she was having pains every three minutes and was complaining. So she was given the above dosage of avertin, the cervix being dilated to three fingers and the head well down through cervix. Sleep ensued at once, the fetal heart, the patient's blood pressure and color all showing no change. The patient was taken to the delivery room at midnight, and delivered of an apparently normal male child without any additional anesthesia. She remembered nothing after the avertin was given, slept all the rest of the night and most of the morning. She made an uneventful recovery as did the baby.

Case 6. Mrs. E. V. W., Para-I, 160 lbs. Avertin fluid, 6 cc. Water, 240 cc.

Patient had been treated for third time with castor oil and quinine. Came to hospital at 11:00 p.m. but had only slight pains which by morning had subsided. Fractional doses of pitutrin were given and active labor resulted. The pains occurred every five minutes throughout the morning, and at 1:00 p.m. the patient was quite tired and the pains were decreasing in intensity. Cervix admitted only two fingers; occiput posterior. She was given above dosage of avertin and went into a sound sleep. Two three minim doses of pitutrin were given thirty minutes apart and the pains again became more intense. Condition of mother and fetus good. Patient moved about with each pain and slept between times. At 4:00 p.m. she began to complain of severe pain in her back and cried out with each pain. She was taken to the birth room at once, ethylene given and a podalic version and extraction of an apparently normal female child done. Babe breathed at once and had a good color at birth. Both mother and baby progressed normally, and the mother remembered only the few hard pains just before being taken to the delivery room.

Case 7. Mrs. F. H. F. Para-I, 183 lbs. Avertin fluid, 6:5 cc. Water, 265 cc.

This woman experienced a rupture of the membranes at 1:00 a.m., came to hospital at once but had only slight pains until 9:00 a.m. She had had some rest and the condition of both mother and fetus was good. Cervix thinning, admitted one finger and the occiput was posterior. Three two minim doses of pitutrin were given over a period of an hour. Active labor resulted. Avertin was given in the above dosage and the patient went to sleep immediately. Pains went on regularly and at noon she had completely dilated and was just beginning to awaken. She was taken to the delivery room, given ethylene and a version and extraction of a normal male infant done. Baby normal in every way. Patient feels that she was saved at least two hours of unnecessary pain.

Case 8. Mrs. K. H. W. Para-I, 160 lb. Avertin fluid, 6 cc. Water 240 cc.

Patient went into labor at 11:00 p.m. and had pains all night and the next morning, each occurring every five to eight minutes with no progress. No dilatation at 9:00 a.m. Patient tired and was allowed to sleep until noon. Then fractional doses of pituitrin were given every twenty minutes until labor pains were severe. A hot enema was then given, followed by avertin in the above dosage. The patient went to sleep at once, the fetal heart was not affected and neither was there any change in the mother's blood pressure, color, pulse and so on. She aroused and spoke incoherently to her husband with each pain. At 3:30 p.m. there was complete dilatation of the cervix. She was taken into the delivery room and delivered of a normal male child by elective podalic version and extraction. The baby was perfectly normal in every way, and both mother and baby got along uneventfully during the puerperium. The mother remembered nothing after the administration of the avertin.

Case 9. Mrs. H. J. N. Para-I. 150 lb. Avertin fluid, 5.4 cc. Water, 216 cc.

Patient came to hospital at 4:30 a.m. She had good hard pains, coming every three to five minutes until 8:00 a.m. At this time she was tired, having had pains the entire night before entering the hospital. There was no dilatation of the cervix. She continued to have pains every three minutes, and was given the above dosage of avertin. Sleep was produced at once and she slept soundly until noon, the pains occurring during this period every five to eight minutes. There was no change in the fetal heart rate, the blood pressure or color of the mother. Patient dozed between pains until 3:30 p.m. at which time uterine contractions became more severe. Complete dilatation had taken place at 4:30 p.m., and the patient was taken to the delivery room, given ethylene and an elective podalic version and extraction of a rather blue infant was performed. This cyanosis cleared immediately following an injection of alpha-lobelin, and the baby cried and breathed normally.

This mother feels that the rectal anesthetic was indispensable in her case, and that without it she would have had a much more severe labor. She remembers only her last hour of the first stage. Both mother and baby made an uneventful recovery.

Case 10. Mrs. J. W. H. Para-III, 220 lb. Avertin fluid, 7 cc. Water, 320 cc.

Patient had always experienced dry labors of the twenty-four to thirty-six hour type. She stated that she always vomited incessantly while in labor, and she was always tired out and felt fatigued for days after delivery.

Membranes ruptured at 5:30 a.m. Much water lost. Right occiput posterior. No pains at 8:00 a.m. Two two minim doses of obstetric pituitrin given at twenty minute intervals. Good five-minute pains began and continued until 11:00 a.m. Cervix dilated to size of a dime. Cervix hard, fetal head high, patient not complaining at this time. At 1:00 p.m., however, pains were coming on every three minutes and were severe. The above dosage of avertin was given, the patient went to sleep at once and slept until 3:30 p.m., rhythmic uterine contractions occurring every five minutes, these causing the patient to move about in bed and give evidence of discomfort. At this time her pains became much more severe and there was full cervical dilatation. She was delivered under ethylene anesthesia by podalic version and extraction.

This patient was very grateful for her short labor, for the small amount of pain which she experienced, for the absence of vomiting and most of all because she felt fine the following day and during her entire puerperium, never having any sense of fatigue whatever. Mother and baby made normal progress during their stay in the hospital.

NASAL PLASTIC SURGERY.

THE CONVEX NOSE IN WOMEN *

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SEATTLE, WASH.

In reconstruction of the nose, one must constantly keep in mind the fact that harmony of features is the ideal toward which one must strive. In certain groups of nasal abnormalities it is quite astounding how the entire face, especially the profile, is thrown out of balance; and, likewise, how correction of the nasal abnormality restores harmony to the entire face. One striking group is that of the convex nose in woman and rare indeed must be the case where such a nose harmonizes with the other facial features. In contrast, it is common knowledge that the convex nose is often extremely well suited to the strong masculine face and a portrait study of men who occupy prominent places in history will show a preponderance of this nasal form.

As regards length of nose, the working rule for measurements of midline of face is: hairline to eyebrow equals eyebrow to tip of nose, equals tip of nose to point of chin. Actually the last named measurement is somewhat greater than the other two which are about equal.

One extremely important influencing factor (and this I have not noted in the literature) is the type of chin as shown by profile. If the chin is prominent, the nose must be longer than the usual facial measurements would show. Conversely, if the chin is receding, the nose must be shorter.

The dorsal plane of nose should form an angle of about 30 degrees with the plane of the face. This is somewhat influenced by the profile of forehead, lips and chin. As a rule, the appearance is better without a distinct nasal notch.

These facts are familiar to the artist who sketches the human face or models it in clay. They are brought forth in this article with the hope that they may be of help at least to the beginner in this fascinating surgical field.

It has been frequently stated that, in order to correct a nasal deformity, previous accurate measurements must be made so that the surgeon knows exactly how many millimeters the nose must be shortened, narrowed, etc. It is my firm conviction that such measurements will never replace the eye skilled in determining artistic proportions.

There is some feeling that individuals desiring

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* Read before the Whatcom County Medical Society, Bellingham, Wash., March 3, 1930.

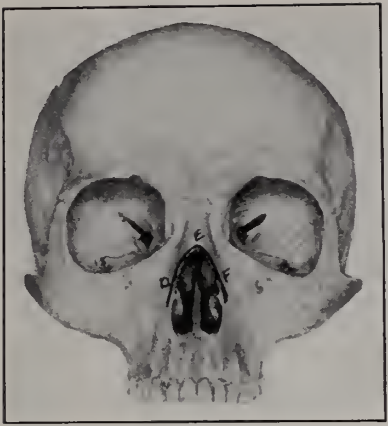


Fig. 1.

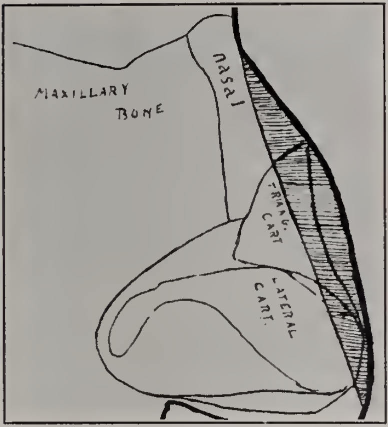


Fig. 2.

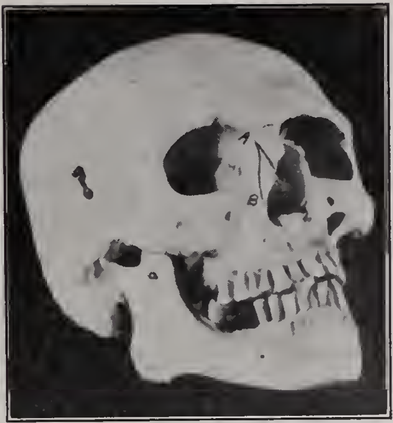


Fig. 3.

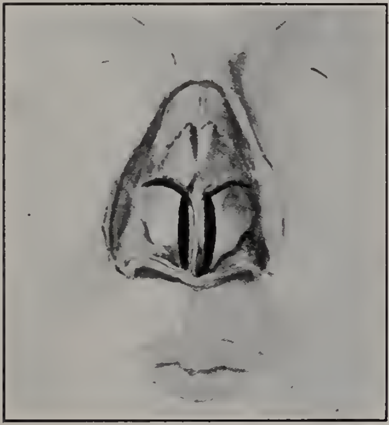


Fig. 4.

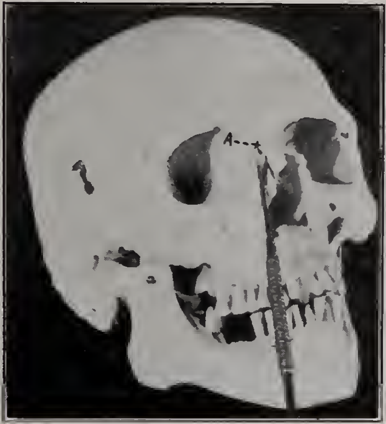


Fig. 5.

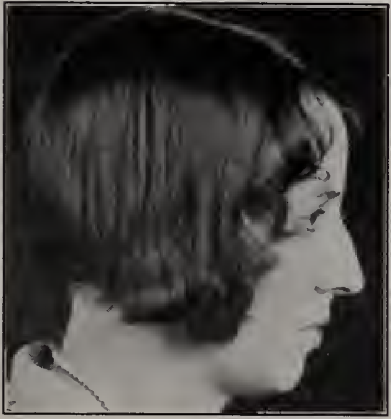


Fig. 6, a.

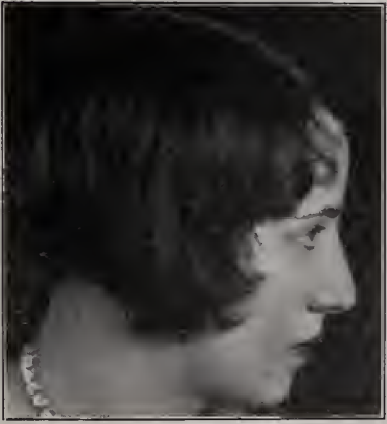


Fig. 6, b.

Fig. 1. D E F indicates position of pyriform incision (intranasal).

Fig. 2. Schematic. Dark portion indicates amount of dorsum nasi removed in lowering plane (Joseph).

Fig. 3. A B is line of saw cut for narrowing bony nose.

Fig. 4. Shows strips of cartilage plus mucosa removed for narrowing cartilaginous nose and for shortening lateral walls.

Fig. 5. Shows method of inserting blunt dissector through pyriform incision to secure drainage. The dissector must reach A, the nasofrontomaxillary junction.

Fig. 6, a. Before operation. Profile shows marked disharmony of features. One might easily fail to observe the artistic contour of upper lip, mouth and chin.

Fig. 6 b. After operation. Note that, with prominent chin, the dorsum of nose should be straight (not concave). Note the nicely rounded nasal tip. Here especially, there should be no suggestion of tension nor angularity.

cosmetic surgery are neurotic and never pleased with results, no matter how good. In one medical publication there was given a system of reasoning, formulated for the purpose of discouraging any patient from undergoing a cosmetic nasal operation. True it is that neurotics are found in any group of patients. They should be watched for and discouraged from having surgical treatment. However, most patients come in with the statement that they consider the nose a disfigurement and inquiring if this can be corrected. Rarely does the patient have any preconceived idea as to what type or size the new nose should be. Generally anyone would agree that there is a disfigurement. I have found these patients a very reasonable group. In every case, where the final result pleased me, it also pleased the patient. In some cases the patient was grateful for the correction, where I felt that the finished product was not entirely all that might be desired.

It is my conviction (some statements to the contrary) that nasal plastic surgery will always be a distinct specialty. The prime reason for the existence of a specialty is its inherent difficulties, and nasal plastic surgery ranks high in these. The surgeon who does a nasal reconstruction at infrequent intervals is hardly fair either to the patient or to the medical profession.

In correcting a convex nose, four procedures must usually be carried out: (1) Lowering of plane of nasal ridge, (2) narrowing of bony nose, (3) shortening of nose, (4) narrowing of cartilaginous nose.

All my cases have been done under novocaine infiltration anesthesia. The skin is prepared with benzene, 3 per cent iodine, alcohol. Intranasal preparation is by swabbing with 3 per cent iodine.

Beginning with the pyriform incision (fig. 1), the skin is undercut over the bony nose and nasal septum. The nasal ridge is lowered with rasps and scissors, working under direct vision (fig. 2). The bony nose is narrowed by cutting through nasal process of superior maxilla by means of a saw (fig. 3) and fracturing these processes, plus the nasal bones mesially.

In order that the final result be pleasing, it is essential to fracture the nasal bones from their attachment to the frontal. In some cases this is difficult to accomplish. A small incision 6 mm. long may be made through the skin, crossing this suture line midway between ridge of nose and inner canthus and parallel to long axis of nasal bone. Through this a small chisel can be inserted and moved subcutaneously so as to sever the nasal bone from the frontal. This incision requires no suture and will leave no visible scar.

The nose is shortened by removing cautiously thin slices from the distal edge of septal cartilage. The cartilaginous nose is narrowed by removing strips of alar cartilage with underlying mucosa parallel and close to the nasal septum (fig. 4).

Healing after this operation is rapid and dependable, due to vigorous blood supply and relative immunity of tissues. For dressing, sterile gauze or tampons within the nose and a splint externally are used.

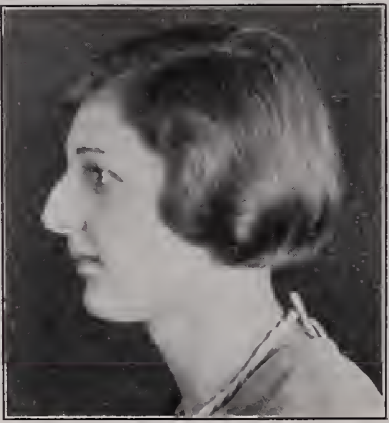


Fig. 7, a.

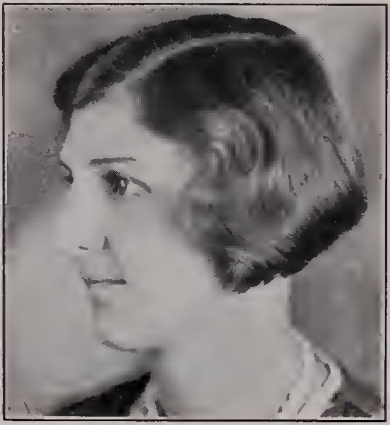


Fig. 7, b.

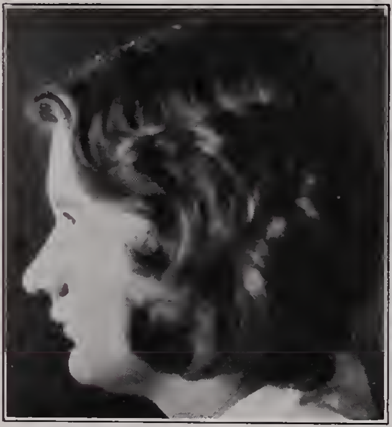
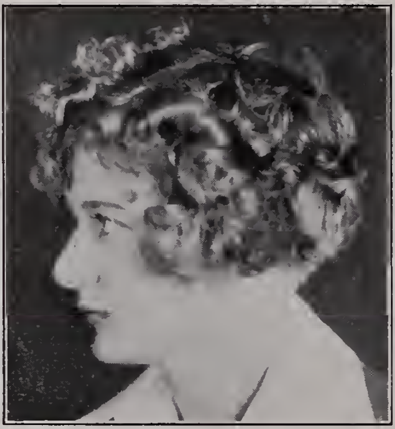


Fig. 8, a.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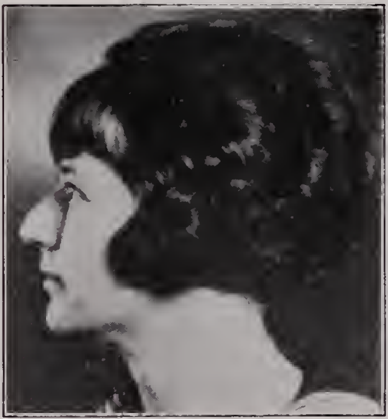
Fig. 9, a.

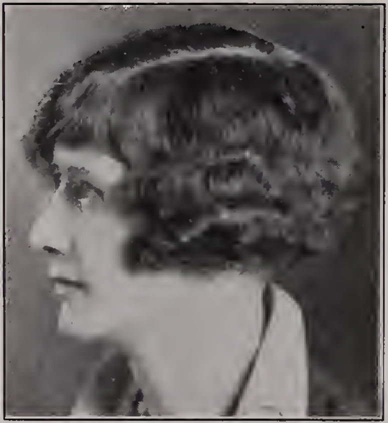
Fig. 9, b.

Fig. 7, a. Before operation. In profile absolute facial disharmony. Nose is too short.

Fig. 7, b. After operation. Note the lowering dorsal plane allowed the nose to be lengthened. The slightly concave line of nasal dorsum harmonizes with the slightly receding chin.

Fig. 8, a. Before operation. A difficult profile to evaluate.

Fig. 8, b. After operation. Dorsal plane of nose lowered. Nose shortened.

Fig. 9, a. Before operation. Markedly oversized nose (birth injury).

Fig. 9, b. After operation. Due to frailness of nasal cartilages, the final result is not all that might be desired. She is, though, one of my most appreciative patients.

The copper saddle splint, as advocated and illustrated by Cohen,* has many advantages. It is easily cut and molded and still is rigid enough to retain its shape. It can be kept clean and is not displeasing in appearance. A patient wearing such a splint can go to school or carry on in most occupations without annoyance. Some very formidable dressings have been devised for nasal plastic cases, requiring that the patient remain in hospital until the dressing is discontinued. It seems to me that the copper saddle splint avoids most of the disadvantages of the more elaborate dressings and gives a maximum of efficiency.

The nasal tampons are removed in forty-eight to seventy-two hours. Sometimes considerable bleeding at this time requires packing. The copper saddle splint is changed and relined with sterile surgeon's lint daily. It is usually left off at the end of ten days.

The only complications to healing which I have encountered are induration, redness and swelling over the saw-cut for narrowing nose. If this occurs, a smooth dissector should be immediately passed through the pyriform incision up to the frontonasomaxillary junction (fig. 5). This allows escape of secretions and should be done daily until the induration disappears.

I cannot overestimate the importance of this procedure. Cold compresses, external medication, external incision are of infinitesimal value in comparison. I have had no case go on to pus formation, where early drainage has been secured and maintained in this manner.

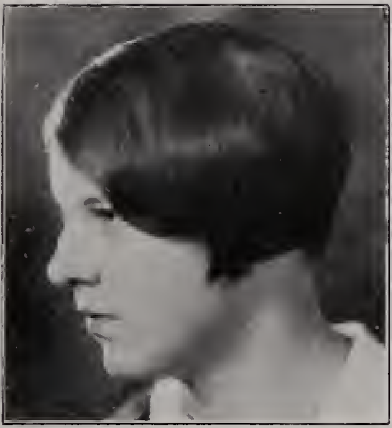

Fig. 10, a.

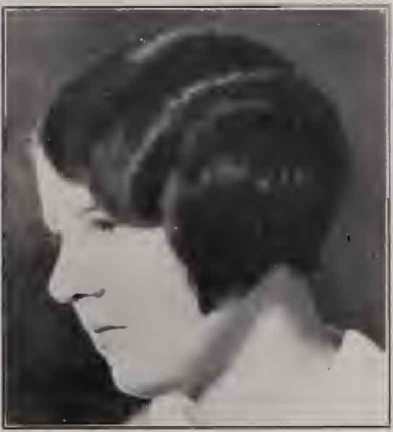

Fig. 10, b.

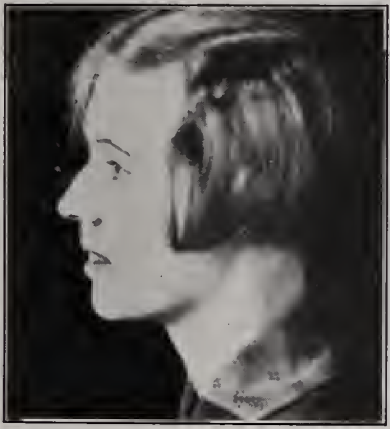

Fig. 11, a.

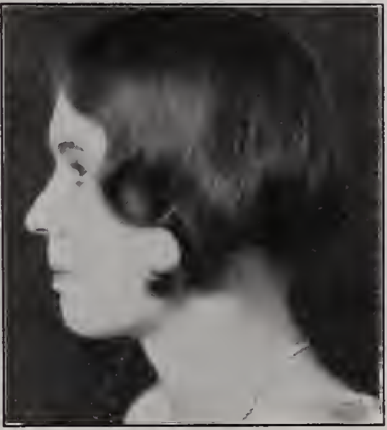

Fig. 11, b.

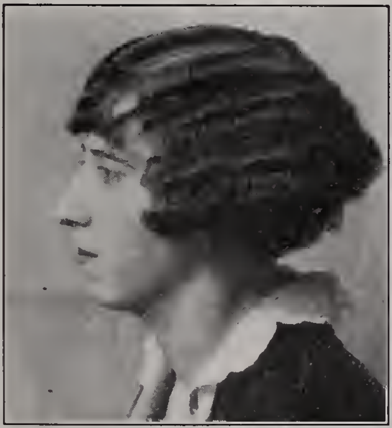

Fig. 12, a.

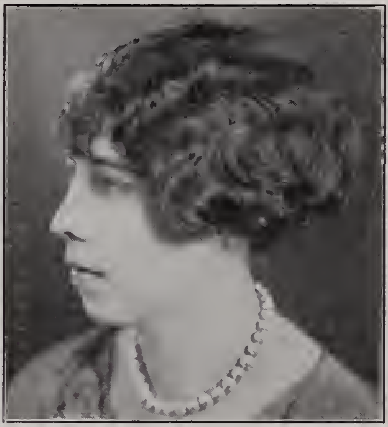

Fig. 12, b.

Fig. 10, a. Before operation. Nose normal except moderate hump present.

Fig. 10, b. After operation. Note rather striking improvement in appearance after slight change in nasal outline.

Fig. 11, a. Before operation. Note that even the contour of forehead seems peculiar, due to lack of harmony of features.

Fig. 11, b. After operation.

Fig. 12, a. Before operation. Nose humped and too long.

Fig. 12, b. After operation. Note that, with receding chin, dorsal line of nose should be concave. Also nose should be shorter than with prominent chin.

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* Cohen, Lee: Corrective Rhinoplasty. Laryngoscope, XXIV, 565, June, 1914.

VALUE OF TESTS FOR THE FUNCTIONAL CAPACITY OF THE LIVER *

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The liver is an organ of great importance, serving many functions and having great powers of regeneration. It is the laboratory where most of the food-stuffs from the small intestine undergo further treatment to prepare them for storage and to deliver them to the body through the blood-stream when required. It is the chief site for the formation of bile to aid in the metabolism of fats. The conversion of sugars to glycogen, its storage and release as glucose is one of its chief functions. The synthesis of urea is confined to this organ. The liver protects the body from toxic substances brought to it through the portal system. Fibrinogen is produced in the liver. Substances which are of importance in the production of red cells are found in this organ, as is shown by the result of its use as a food or through extracts made from it in primary anemia. The liver may be of a great importance also in the metabolism of the vitamins. Other functions of the liver are more obscure. According to Crile the liver is the great storage battery of the body.

The limits of the functional capacity of the liver are wide. Our knowledge of these functions has accumulated slowly under difficult experimental conditions. In man, it has been necessary to adopt indirect methods to estimate the separate functional capacities in health and disease. Recently[1-9] tests have been devised to determine the ability of the liver to withdraw foreign substances (dyes) from the blood-stream, when such substances are eliminated chiefly through this organ. We may speak of them as permeability tests, and they are analogous to the dye tests for renal excretion.

TESTS FOR PIGMENTARY FUNCTION

Early observations were made on patients with jaundice. The yellow color of the skin and mucous membranes are apparent. All are familiar with the tests for bile pigments in the urine, its smoky color, the yellow foam and yellow staining reactions to cloth, etc.; the absence of bile pigments from the stool giving it a pale whitish appearance, not "clay-colored," since clay may have a variety of tints. We have long been used to first-hand methods of testing in this field.

Latent jaundice, where the bile pigments are but slightly increased in the blood stream, or where urobilin or urobilinogen, precursors of bile pigments, are present in excess, has only recently been subject to analysis. If the liver is unable to convert urobilin or urobilinogen into bilirubin, they are found in the blood and urine in excess, e.g., in primary anemia, hemolytic acholuric jaundice and in the preicteric stage of catarrhal jaundice. During complete obstruction of bile flow they are not found but appear in excess when the obstruction is released. Pigments may also be found in body cavities associated with recent local hemorrhage.

An increased amount of bilirubin in the blood serum imparts to it a yellow color which, when diluted and compared with a normal standard, gives an index of the content of this pigment, the *icterus index.* The normal index values range from 4 to 6, increasing from this point to 10 and 15 in latent jaundice, and may be as high as 200 or more in complete obstruction. Care should be taken to exclude hemolysis of red cells, to avoid lipemia and to eliminate from the diet foods which contain carotin (carrots, oranges and other foods). The test is but roughly quantitative. Other quantitative tests have been devised but have not proven as simple and accurate in operation as we should desire for clinical study.

Excessive amounts of bile salts in the urine may be observed in diseases of the liver, but these substances are usually not found in dissociation from bile pigments.

The van den Bergh reaction[10, 11] has been used to differentiate the obstructive from the hemolytic types of jaundice. The older views of Virchow, more recently supported by Whipple, Aschoff[12] and others, that bile pigments may be formed outside of the liver, have been rather generally accepted. The reticuloendothelial system appears to be chiefly concerned with the formation of bile pigments or their precursors, and in the liver particularly, through the agency of the Kupffer cells. In the liver such pigments are then passed on through the polygonal cells to the bile capillaries for excretion in the bile. Obstruction of the biliary tract may cause the pigments to be absorbed into the blood stream after passage through the polygonal cells, and to be ultimately excreted in the urine. As an alternative condition the polygonal cells may lose their ability to pass the pigments on to the bile capillaries or may not be able to handle large amounts of pigment resulting from excessive destruction of red cells in the body and a release of free hemoglobin. Or we may have a combination of these two conditions with partial biliary obstruction and damaged polygonal cells. Bile pigments would then be absorbed into the general circulation from the biliary tract as well as from the Kupffer cells.

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* From the Department of Medicine, University of California Medical School.

* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

1. Delprat, G. D., Jr.: Arch. Int. Med., xxxii, 401, 1923.
2. Delprat, G. D., Epstein, N. N. and Kerr, W. J.: Arch. Int. Med., xxxiv, 533, 1924.
3. Epstein, N. N., Delprat, G. D. and Kerr, W. J.: J. A. M. A., lxxxviii, 1619, 1927.
4. Epstein, N. N. and Rauschkolb, J. E.: Arch. Dermatol. and Syphilol., xiv, 122, 1926.
5. Kerr, W. J., Delprat, G. D., Epstein, N. N. and Dunievitz. M.: J. A. M. A., lxxxv, 942, 1925.
6. Rosenthal, S. M.: Jour. Pharm. and Exp. Ther., xix, 385, 1922.
7. Ibid: J. A. M. A. lxxxiii, 1049, 1924.
8. Rosenthal, S. M. and White, E. C.: J. A. M. A., lxxxiv, 1112, 1925.
9. Rowntree, L. G., Hurwitz, S. H. and Bloomfield, A. L.. A. L.: Johns Hop. Hosp. Bull., xxiv, 327, 1913.
10. McNee, J. W.: Quart. Jour. Med., xvi, 390, 1923.
11. Delprat, G. D., Jr.: Arch. Int. Med., xxxii, 401, 1923.
12. Aschoff, L.: Münch. med. Woch., lxix, 1352, 1922.

Van de Bergh found that Ehrlich's azo reaction,[13] in the presence of icteric sera either gave an immediate color or a very delayed reaction. He associated the *direct* reaction (which appeared at once) with obstructive jaundice, where the pigments had passed through the polygonal cells of the liver, and the delayed *direct* reaction with hemolytic jaundice, where the pigments had passed only through the Kupffer cells but not through the polygonal cells. When both reactions occurred in the same specimen (the *biphasic direct*), a more diffuse process was suspected, e.g., toxic or infectious hepatic jaundice. In practice a direct immediate reaction is fairly constant in the early stages of obstructive jaundice, but if the obstruction continues, the biphasic response may appear and is often misleading.

A quantitative test for bilirubin may be employed in the indirect van den Bergh reaction, and is expressed in units, the blood serum normally showing less than one-half unit. The renal threshold is about 4 units, but in hemolytic jaundice the units may vary from 5 to 18. In such cases the pigments may be excreted in the urine as urobilin. Precautions must be taken as for the icterus index. The stools should also be examined for bile pigments.

In our clinic we have not placed very much reliance in the van den Bergh tests. The icterus index and Schlesinger's[14] test for urobilin have been most helpful.

METABOLIC FUNCTIONS

Protein metabolism. Urea is formed in the liver from ammonia after the deaminization of amino acids. While one may, therefore, expect excess of ammonia or decrease of urea in the urine in diseases of the liver, these changes are seldom noted excepting with very extensive damage. The ratio of urea nitrogen to total urinary nitrogen has been used to test the function of the liver to form urea. The nonprotein nitrogen fraction is also said to be increased in severe injury to the liver. In acute yellow atrophy and other wide-spread destructive processes amino acids, especially leucin and tyrosin, are sometimes found in the blood and urine. The methods of isolation are tedious and not very satisfactory.

Carbohydrate metabolism. The liver plays a most important role in carbohydrate metabolism. It is the granary for glycogen which is converted into glucose and delivered to the blood stream as required. It is obvious that, if the liver were seriously and extensively damaged, this function would be impaired, although the margin of safety is great.

Other carbohydrates such as levulose and galactose are not handled so easily as glucose, and if the liver is damaged, the concentration of reducing substances tends to increase in the blood stream after ingestion and may appear in the urine. Tests for hepatic function have been developed on the basis of these observations and have been useful in the recognition of disease in this organ. The rise in reducing substances in the blood (presumably blood sugar), after the ingestion of a known amount of the levulose or gelactose, indicates the extent of the hepatic injury. The urinary values for sugar are of little importance.

In our clinic, during the past few years, we have been interested in a modified glucose tolerance test[15] which we find of value in estimating the functional capacity of the liver, although we can say that the full import of this test is not as yet completely understood. In a case of chronic disease of the liver, associated with cholangitis and chronic pancreatitis with severe diabetes, we noted that frequently, without apparent cause, alarming symptoms of hypoglycemia occurred when the insulin dosage remained constant. In another case of marked hemochromatosis with severe diabetes the same reactions were noted. Oral administrations of glucose had no apparent effect on the reactions, but intravenous glucose promptly allayed the symptoms.

These observations suggested that either the liver was at fault or the absorption of glucose from the gastrointestinal tract was intermittently impaired.

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[13] Ehrlich: Centralbl. f. klin. Med., vii, 593, 1886.

[14] Schlesinger, W.: Deut. med. Wchschr., xxix, 561, 1903.

[15] Althausen, T. L., Gunther, Lewis, Lagen, J. B. and Kerr, W. J.: Arch. Int. Med., xlvi, 482, 1930.

We were led to further study of the subject and found that, if we modified the glucose tolerance test, gave insulin followed by a definite amount of glucose by mouth, and administered an excessive quantity of water, the resulting blood-sugar curve (reducing substances) was of great interest. The details of the test are as follows: A fasting blood-sugar is taken; twenty units of insulin are given; twenty minutes later 50 grams of glucose are given by mouth in 500 cc. of water, followed at once by 1000 cc. of water; the second blood-sugar sample is taken; and one hour later the fourth sample and at the subsequent hour the fifth and last sample is taken for blood-sugar determination. Thus we have the blood-sugar level over a period of three hours. In normal controls the final blood-sugar level does not fall below 7 mg. of glucose per 100 cc. of blood, but with impaired carbohydrate metabolism the level may go to a very low point, accompanied by symptoms of hypoglacemia. If such symptoms appear at any point in the test, glucose is given and the test terminated. In the presence of diabetes the test may also be employed, if the fasting blood sugar is near the normal level.

We have found that the results of this test parallel closely the dye tests (Rose Bengal in our series) for permeability of the liver, and, furthermore, they may be used in the presence of jaundice, when the dye tests are of little value because of the difficulty in matching colors. It is possible that the liver is not the sole organ involved in this reaction and also that certain portions of the lobules of the liver may be diseased without showing the hypoglycemic reaction.

We have also found that certain conditions of the liver, such as the so-called toxic cirrhoses, may be recognized and differentiated from other conditions of the liver by this test. We have had three cases of this type, which indicate that the regenerated hepatic tissue, during recovery from extensive necrosis and where the newly formed cells are not in direct communication with the bile capillaries, has the power of handling carbohydrates, whereas the dye tests show a marked impairment of permeability.

DETOXIFYING FUNCTIONS OF THE LIVER

Certain substances, such as camphor, the salicylates and others which may be harmful to the body, are combined in some way in the liver and excreted in the urine in conjunction with glycuronic acid. If this acid does not appear in the urine, the liver is said to be damaged. Indicanuria is also said to indicate a disease of the liver. These tests have not had a wide application.

OTHER TESTS ON THE BLOOD

Coagulation time may be increased in diseases of the liver.[16] This may be due to a decreased fibrinogen content which is supplied normally by the liver. In recent years calcium has been given by mouth and intravenously in cases of prolonged jaundice on the assumption that, although the total blood serum calcium was normal, it was bound in some manner with the bile pigments. Studies in our laboratory have shown, however, that the diffusible and nondiffusible calcium values are both normal in jaundice, which suggests that some other factor is missing in the blood stream, perhaps fibrinogen, which is only one of the factors concerned with coagulation of the blood. An excess of calcium salts, after intravenous injection, are effective in controlling bleeding as is well known from clinical experience.

Blood from cases of severe injury to the liver may have the power of digesting its own clot, as shown by Goodpasture.[17] In our experience this is most often seen in extensive necrosis of the liver as in acute yellow atrophy.

Blood lipase may be increased in diseases of the liver as shown by Whipple.[18]

The Widal hemoclasis reaction has been used to test the functional capacity of the liver.[19, 20] The postprandial leucocytosis is well known. In diseases of the liver the leucocyte count may remain normal or be decreased. In the test about 200 cc. of milk is given and subsequent counts are compared with a fasting control. Although much has been written on this test, we have not found it of great value. The technical difficulties in making accurate blood counts in practice often lead to a doubtful result.

THE DYE TEST FOR PERMEABILITY OF THE LIVER

Rowntree and his associates first used the dye, phenoltetrachlorphthalein, which is excreted largely through the liver, to test the capacity of this organ to eliminate foreign substances. Later, after several modification by others,[21] the rate of removal of the amount due from the blood stream was found to

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16. Whipple, G. H. and Hurwitz, S. H.: Jour. Exp. Med., xiii, 136, 1911.

17. Goodpasture, E. W.: Johns Hop. Hosp. Bull., xxv, 330, 1914.

18. Whipple, G. H., Mason, V. R. and Peighthal, T. C.: Johns Hop. Hosp. Bull., xxiv, 207, 1913.

19. Widal, F., Abrami, P. and Iancovesco, N.: Presse Medicale, xxviii, 893, 1920.

20. Ibid: Presse Medicale, xxix. 121, 1921.

21. Boardman, W. W. and Shoonmaker, G. D.: Am. Jour. Med. Sc., clxviii, 688, 1924.

be more accurate, and other halogen dyes of this series were used. This test has been of distinct value in estimating the total function of the liver.

In our clinic studies have been made on another dye, Rose Bengal (di-iodo-tetra-chlor-fluorescein of the triphenylmethane series), which contains six halogens. It has been shown that dyes of this series which contain six or more halogens are eliminated entirely through the liver, while those with four or less may be excreted in part through the kidneys. The size of the molecules may determine the route of excretion and the same may perhaps be said of the phthalein dyes (with four halogens) which are in part excreted through the kidneys.

In the clinical test, 50 mg. of Rose Bengal are given intravenously and samples of blood are taken at two minutes and after a period of eight and sixteen minutes. Comparisons are then made with the two minute samples as a standard. In the normal control the dye is rapidly eliminated from the blood stream, but in extensive damage to the liver it is retained in high concentration, sometimes for hours. Various degrees of retention are also indicated in intermediate cases. We have found the test to be simple in operation, safe to use and helpful, especially in cases of cirrhosis of various types. Obstructive jaundice makes the test of little value, but under such circumstances other tests may be employed, e.g., the modified glucose tolerance test described above. In hemolytic jaundice, the test shows normal values. In catarrhal jaundice there is a delay in excretion which improves as jaundice clears. In carcinoma of the liver, without obstructive jaundice, the test may be normal, even if most of the liver is replaced by tumor. In cardiac disease the test gives normal values. In ascites with tuberculous peritonitis and carcinomatosis of the peritoneum, the test shows normal values.

Other dye tests have been devised in conjunction with simultaneous visualization of the gallbladder but we have had no experience with these.

VISUALIZATION OF THE GALLBLADDER

Various halogen phthalein dyes, which are excreted largely through the liver, have been used to test the integrity of the gallbladder. The dye is normally eliminated by the liver, enters the gallbladder, is concentrated there and excreted under stimulus from the duodenum. This test is well known and requires no further discussion here. In conjunction with other tests mentioned above, it has proven of great diagnostic value in studies on the liver and the biliary tract.

LYON'S DRAINAGE

This test, formerly in common use, is of some value in diagnosis.[22] We have found it helpful in the recognition of typhoid carriers and in amebic infections of the biliary tract and liver. When used as a therapeutic procedure it has a place in practice.

CONCLUSIONS

From the foregoing it may be seen that there are many ways to secure indirect evidence concerning the liver and its functions. We cannot make an exact diagnosis by the use of any one of these tests or any combination of them, but we are more accurate than we were a few years ago. When taken in conjunction with the clinical picture of disease, we have been highly gratified with the confirmation afforded by properly selected tests. It should be constantly kept in mind that, if any test is a true functional test, the results are subject to change from time to time, in consideration of the great power of the liver for regeneration.

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[22] Lyon, B. B. V.: J. A. M. A., lxxiii, 980, 1919.

AN ETIOLOGIC CONCEPT OF CHRONIC ARTHRITIS*

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Arthritis is the oldest disease of which we have any definite record. Far older than civilization itself, archaeology bears out the fact that it is as ancient as the hills. The skeletal remains of prehistoric animals, such as the pithecanthropus erectus, which lived at a period of approximately five hundred thousand years ago, bear record of hypertrophic arthritis; and prehistoric man of the Mousterian and Neanderthal periods, approximating one hundred thousand years back, show unmistakable arthritis deformans. Coming down to historic periods, Dr. Eliot Smith describes the osteoarthritic changes in Egyptian mummies, making the statement that this disease shows itself in these remains far more frequently than any other. Hippocrates, Galen and Aretaeus made frequent mention of it in classic medicine; and coming down to more modern times Sydenham described a chronic form lasting as long as life. The great galaxy of literature on the subject of arthritis necessarily presents this as one of the most difficult of concise discussion.

The rheumatoid arthritis of Garrod, the atrophic arthritis of Goldthwait, the proliferative arthritis of Nichols and Richardson[1] are different terms which describe the same definite pathologic entity. This constitutes a picture of inflammatory changes and is, therefore, considered on an infectious basis, while the terms osteoarthritis (as used by the English), hypertrophic arthritis, degenerative arthritis represent a pathologic entity similar to arteriosclerosis or chronic nephritis, a noninfectious process due to senile changes. The recognition of these two distinct types of arthritis as being due to dissimilar etiologic processes is of vast importance.

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* Read before a meeting of Pierce County Medical Society, Tacoma, Wash., Oct. 28, 1930.

[1] Nichols, E. H. and Richardson, F. L.: Jour. Med. Research, 21, 149, 1909.

In the atrophic type there is a proliferation of synovial membrane producing granulation tissue which sooner or later extends over the joint cartilage with destruction of cartilaginous tissue. Proliferation of perichondrium may lead to formation of new cartilage or bone. The capsule and other periarticular structures are also involved in the process. These inflammatory changes, if not checked, lead to the destruction of the joint cavity with fibrous or bony union. In the opinion of Nichols and Richardson these changes represent a reaction to injury that may be either bacterial or toxic.

In hypertrophic arthritis the primary change is a degeneration of the cartilage of the articular surfaces which gradually become softened and eroded, exposing the underlying bone structure. This exposed bone becomes dense and enlarged and leads to an actual increase in size of the articular surface. Secondarily, the perichondrium increases its activity, causing new cartilage formation which may later be transformed into bone. This newly formed bone takes the form of lipping and irregular exostoses, readily identified by the roentgenogram.

It is essential that we keep clearly in mind these two distinct pathologic entities, so that we may fully recognize and appreciate this difference in our clinical classification. By so considering our subject we may discuss the etiology in a more definite manner.

I have therefore classified chronic arthritis into two main groups: (I) Atrophic arthritis, (II) hypertrophic arthritis.

ATROPHIC ARTHRITIS

Under the first heading I have made three subgroups: (1) Specific arthritis, which includes all those cases due to a known organism, such as the gonococcus, the tubercle bacillus, and the spirocheta pallida; and the surgical joints due to infection with staphylococcus, pneumococcus, meningococcus, etc. (2) Chronic infectious arthritis, directly referable to foci of infection. (3) True arthritis deformans, the exact nature of which is still a moot question etiologically.

The first group hardly belongs in a paper of this kind, so I will limit my discussion to the latter two.

First, let us consider the common etiologic factors of these two groups collectively. One finds that atrophic arthritis is about three times as common in women as in men. The disease is essentially one of young people, as Archer[2] also emphasized. The average age is thirty-five with the great majority being between thirty and forty.

One cannot deny the strong tendency of a constitutional diathesis through inheritance. The patients are usually slender, visceroptotic, somewhat anemic and of high strung nervous temperament. Worry, sudden shocks, trauma and overwork are recognized factors oftimes culminating in an attack. These events, however, have led the medical profession to view arthritis with a pessimistic attitude and only recently has a more optimistic viewpoint of the whole subject been taken.

Atrophic arthritis is a polyarticular disease which may involve any joint in the body, usually migratory in its early stages, but after several attacks the joints become permanently injured. The fingers, knees and shoulders are most commonly involved. This form is painful and accompanied by swelling. The most typical landmark of this type of arthritis is a characteristic fusiform enlargement of the finger joints. After two or three years duration ankylosis is commonly found. This may be fibrous at first, but later becomes bony.

In consideration of these groups separately, chronic infectious arthritis is most assuredly of infectious origin as its name implies, and is directly referable to foci of infection. Tonsils stand foremost among the causative factors, averaging from 61 to 85 per cent in different groups of cases reported. Probably this percentage would run even higher, if we were able to recognize all septic tonsils by inspection. This is sometimes difficult and can only be corroborated by removal of all tonsils where arthritis is present. Then it is that we discover a good many, containing deep seated abscesses which from inspection appeared perfectly innocent. I am not recommending wholesale removal of tonsils, but I believe that, unless there is some definite contraindication, all chronic cases of atrophic arthritis should have the tonsils removed.

Teeth are considered second in importance. Of Archer's series apical abscesses comprised 35 per cent and the age incidence was ten years over that for infected tonsils. I believe that all devitalized teeth should be eyed with suspicion and a negative roentgen-ray finding does not preclude an absence of apical infection.

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[2] Archer, B. H.: Med. Clin. N. A., 659, Nov., 1928.

Sinuses are certainly of importance in the role of infection. Some of our nose and throat confreres, however, are a bit too enthusiastic on the subject of radical operation and the results obtained thereby. I find it hard to give the patient a plausible excuse for the failure of such operation which was supposed to promise so much. The conservative so-called closed drainage method is winning advocates necessarily, because of the wholesale way in which sinus operations have been performed without clear indications. I am not recommending closed drainage as a substitute, however.

Prostatic infection runs a good fourth as a possible cause of arthritis. I believe the percentage recorded by most authors, one-half to one per cent, is too low. Probably a good many cases are overlooked because of a failure to examine the prostate as a part of the routine examination. Nickol[3] reports several cases from prostatic infection, a culture of which when injected into rabbits caused joint lesions. I have felt certain that not a few cases of my own have benefitted remarkably by proper attention to the prostate.

In the female, cervical and adnexial infections play a role, but probably not the part that gynecologists would lead us to believe. The gallbladder and appendix at times are assignable causes, but all other foci should be eliminated before recommending operation.

The colon has been assigned the seat of all our troubles more than once. Autointoxication was a theory that gained impetus and then waned and finally died a natural death, only to receive artificial respiration in an endeavor to bring it to life again. If the colon is so often at fault, why is there not more arthritis seen as a complication of chronic ulcerative colitis and like conditions of the colon? Experimental evidence is not conclusive in pointing a finger at the large bowel. Possibly there is reason to believe that some perverted physiology in the colon may keep alive an allergic state, capable of acting as a catalyzer for an already established arthritic process.

An actual case of general allergy due to chronic ulcerative colitis may be worth presenting in brief:

A young woman, age 35, somewhat anemic, visceroptotic to an extreme degree and of a high strung nervous temperament, had been suffering from diarrhea with much mucus and blood in the stools for more than three years. She had previously been operated on without success for what was supposedly a tuberculous infection of the bowel. She had lost about twenty pounds from actual starvation, due to inability to eat various foods, mostly of a protein nature.

Repeated stool and proctoscopic examination revealed ulceration but no endameba hystolytica nor tubercle bacilli. Roentgen-ray examination showed a marked ptosis with some slight spasticity. She was sensitive to eggs, milk, meat and various other articles of food too numerous to mention. Soda crackers and rice were about the only things she could eat persistently without developing an allergic condition, characterized by asthma, angioneurotic edema and urticaria of giant size. After various methods of treatment had failed an ileocolostomy was performed and then an interesting experiment developed.

As long as no food was allowed to pass through the colon the patient could eat a great many heretofore impossible foods without any signs of allergy developing. If, however, a little content of the terminal ileum was allowed to escape into the colon the same allergic reaction mentioned above reappeared. The patient had lost so much weight and was such a poor surgical risk that the operation was insufficient to allow recovery. She finally died of inanition.

Autopsy showed little of interest outside the colon itself. This organ was found to contain no macroscopic ulcerations, although she had bloody stools up to the very day of her death. Microscopic section, however, revealed very minute microscopic ulceration points with petechial hemorrhages into the mucosa; the submucosa and muscularis were packed with masses of polymorphonuclear leucocytes.

This is evidently an extreme case of allergy, arising from a chronic ulcerative colitis, and yet this patient had no arthritic symptoms whatever. If she had had an arthritis with this condition, and she was certainly the exact type for one, the colon would have been assigned the cause.

Pyelitis likewise may be a contributory factor but probably not the inciting cause that brings about an infectious arthritis.

The role of foci of infection in the production of arthritis depends upon the ability of these foci to harbor hemolytic streptococci and present optimum condition for their multiplication and dissemination to other parts of the body. This condition best exists in the oral cavity and its appendages, and least in the gastrointestinal tract.

From the foregoing discussion the first stage of chronic atrophic arthritis, namely chronic infectious arthritis, is considered as being directly referable to foci of infection. The second stage or true arthritis deformans will be considered, first, as a continuation of this process and, second, from other etiologic factors engrafted on an inflammatory condition arising in the first stage.

Gibson,[4] in a discussion of rheumatoid arthritis, speaks of the seed and the soil. We must consider the fact that there must be at least two factors, and probably more, operating to bring about the production of an arthritic process. The "seed" supplied by the foci of infection probably light on "soil" capable of an inflammatory reaction characterized by an acute joint. The reaction, however, soon subsides and is apt to appear in another joint. All along the line we see evidence of the protective forces of the body reacting efficiently with subsidence of the process. And if the foci of infection are located and removed, we can reasonably expect complete recovery.

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[3] Nickol, A. C. and Stuhler, L. C.: Med. Clin. N. A., May, 1930.

[4] Gibson, A.: Jour. Bone and Joint Surg., Vol. 10 1928.

But what of the patient who has had exacerbations of his arthritis and seeks medical attention after two or more years of trouble and who has had all the prescribed treatment, including removal of all possible foci of infection, first one, then another and another until little is left and yet he is no better of his disease? What of the patient who has a focus removed with a subsidence of joint symptoms, only to have it flare up again with the advent of some trivial respiratory infection? Are we to discard our whole conception of infection because of such occurrences as these, which are by no means a rarity?

The answer lies in the fact that the primary focus is no longer primary. We are aware of the fact that the cervical glands, which enlarge during an attack of acute tonsillitis, still undergo enlargement with almost every respiratory infection the patient has after the tonsils have been removed. This is not argument against removal of the tonsils. But a secondary focus has been set up, which is fanned into flame by little provocation, either from the original primary focus or by concomitant infections elsewhere. The tonsil is probably the main route through which pulmonary tuberculosis develops in children, yet we would hardly expect to cure tuberculosis by simply removing the tonsils after the infection has passed on to contiguous glands.

Forkner[5] obtained cultures of hemolytic streptococci from lymph nodes in the neighborhood of arthritic joints in 48 per cent as against 22 per cent from the synovial fluid. If it were possible to excise lymph nodes from all patients suffering with arthritis deformans, we would probably find hemolytic streptococci in a high percentage of cases. There is much food for thought along this line.

Small[6] acknowledges just such a route of infection and brings forth an added factor that may play a real part in the reactivation of an arthritic process. He states that the causative organism is the streptococcus arthritides and the modus operandi is as follows:

1. Through immediate effects of lodgment and growth of the streptococcus in the tissues.

2. Through the action of toxins (endotoxins) distributed generally from some local focus of growth.

3. Through the action of some other bacterial products, distributed from a focal source and capable of inducing and maintaining an allergic state.

This allergic phenomenon is a relatively new explanation of no small import. A streptococcus antigen which produces this state is not a specific antigen. It seems that some protein factor, thermostabile, common to a great many related organisms and some nonbiologic protein factors can all act as antigens. Birkhaug[7] confirmed this by showing that animals rendered hypersensitive to antigens of streptococci were also hypersensitive to those of pneumococci, and Opie[8] found that rabbits present this same hypersensitive state to egg albumin and horse serum.

Once this allergic state has been produced, very minute amounts of this protein acting as antigen will keep the process alive. Small was able to cause acute exacerbations of an arthritic process by the injection of 1/20 cc. of 1-100 million dilution of his saline extract of streptococcus arthritides antigen (1/20 billionth milligram). After the primary inflammatory process has been set up, then by this allergic phenomenon, possibly acting through the neurovascular system, vasoconstriction results, rendering the joint anemic and susceptible to a reactivation of the arthritic process resulting in fibrous or bony ankylosis. Possibly it is through such a perverted physiology that sympathetic ganglionectomy has proved so beneficial in the limited number of cases in which it has been tried.

Zinsser[9] and Swift[10] are of the opinion that the role of any specific organism in arthritis is of less importance than a general allergic background on the basis that a variety of organisms may, through some common property already discussed, produce comparable effects.

Pemberton[11] found a slight lowering of basal metabolism, prolonged sugar excretion and low sugar tolerance which he has explained on a basis of vasoconstriction, but gives us no hint as to its cause. The basis of his conception of treatment seems to be in treating the effect rather than getting at the cause.

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[5] Forkner, C. E., Shands, A. R., Jr., and Poston, M. A.: Arch. Int. Med., 42, Nov., 1928.

[6] Small, J. C.: Med. Clin. N. A., 857, Jan., 1930.

[7] Birkhaug, K. E.: Jour. Infect. Dis., 43, 280, 1928.

[8] Opie, E. L.: Jour. Immunol., 9, 231, 1924.

[9] Zinsser, H.: N. Y. Acad. Med., 4:351, 1928.

[10] Swift, H. F., Derrick, C. L. and Andrews, C. H.: Jour. Exp. Med., 44, 35, 1926.

[11] Pemberton, R.: Nelson's Loose Leaf Med. Rev., May, 1929.

HYPERTROPHIC ARTHRITIS

Hypertrophic or degenerative arthritis presents a direct contrast to the atrophic type and should be considered as a different disease entity. Infection probably plays no role in its production; this type should be regarded as one of the many senile changes that occur as a result of endarteritis.

The salient features in contrast are as follows: In the hypertrophic form the age incidence is near sixty, while in the atrophic form it is usually two or three decades earlier. These patients are usually overweight, phlegmatic, present no anemia or visceroptosis as in the atrophic form. Where one presents a picture of inflammatory changes, with leucocytosis and a proliferative reaction with narrowing or obliteration of the joint space, the hypertrophic form shows primary degeneration, no leucocytosis and the joint space is widened with exostoses and spurring. In the atrophic form the fusiform finger joint is typical, while in the hypertrophic variety the Heberden's nodes and grating knee joints are pathognomonic.

It is unreasonable to believe that such a contrast of pictures could be due to the same cause. One shows all the signs of an inflammatory process with its analogue, gonorrheal arthritis, while the hypertrophic type presents a picture of degeneration from senescence.

The patient with hypertrophic arthritis has little trouble until later in life, and then only when he acutely injures some joint or when the degenerative changes have reached a point wherein motion becomes restricted. The degree of joint change seems to depend principally on the amount of daily trauma the joint receives and is chiefly found in the large working joints, such as the lower back, hips, knees and cervical spine. Other joints may be affected but it is usually the weight-bearing ones which receive the daily strain either by reason of postural misuse or occupation.

Archer classifies this type as menopausal and bases his assertion on the fact that it so frequently comes on with the advent of the climacteric. An artificially induced menopause will frequently bring about such an arthritis according to the opinion of Burt,[12] Coates,[13] Cumberbatch[14] and others. This has led these English authors to classify this as hypoglandular arthritis. At least it appears that an endocrinous dyscrasia may be a direct and important etiologic factor. I prefer not to term degenerative arthritis hypoglandular, as there are other factors operating as well. We should be very careful not to misconstrue this type of arthritis as a true arthritis deformans arising at this period of life.

CONCLUSIONS

The classification of arthritis should be founded on pathologic rather than purely clinical evidence. We should be open minded and consider more than one, and possibly more than two factors operating to bring about an arthritis. Dogmatic statements, assigning every type to one causative factor, are harmful to the advancement and simplification of our knowledge of a very complex subject.

SUMMARY

1. An attempt has been made to classify arthritis from an etiologic viewpoint.

2. Atrophic arthritis has been considered under two headings, namely, infectious arthritis and true arthritis deformans.

3. Infectious arthritis is directly due to foci of infection. Tonsils, teeth, sinuses, prostate, cervix, gallbladder, appendix and colon are considered important in the order mentioned.

4. A case of allergy is presented to demonstrate the fact that a specific case of ulcerative colitis was not productive of an arthritis in a susceptible patient.

5. True arthritis deformans is considered (a) a direct continuation of an infectious arthritis arising from hidden foci, and (b) a result of an allergic state set up in the body.

6. Emphasis is placed on a multiplicity of etiologic factors being necessary to the production of an arthritis deformans rather than any single factor.

7. Hypertrophic arthritis is considered a noninfectious entity, the result of senescence or endocrine imbalance.

8. It is important to make an accurate differential diagnosis of these types in order to make a rational approach to treatment.

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Roentgen Diagnosis of Small Pleural Effusions. In a new position for roentgen examination of pleural effusions, presented by Leo G. Rigler, Minneapolis (*Journal A. M. A.*, Jan. 10, 1931), the patient lies on the affected side, the film being in front, the x-ray tube behind. Small effusions, which are entirely invisible in the usual positions, may be readily detected in this lateral decubitus position.

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[12] Burt, J. B.: Proc. Royal Soc. Med., 20, 511, 1927.
[13] Coates, V.: Ibid.
[14] Cumberbatch, E. P.: Ibid.

PRIMARY BRONCHIAL CARCINOMA

THE LIFE HISTORY OF A CASE

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Primary carcinoma of the lung is very rare, while secondary involvement is a common occurrence, ten times more frequent than primary malignancy. I have seen but three cases of primary lung cancer, one primary in the pleura, but in my service at the County Hospital there were at the same time in adjoining beds three patients with secondary carcinoma of the lung, following operation for breast cancer.

I am reporting the following case because it has been observed from its incipiency to its termination at autopsy, and only from such completed cases can one draw any worth-while conclusions, as was long ago emphasized by Sir James Mackenzie.

A few general remarks on the subject may be permitted. The etiology of primary cancer of the bronchus is uncertain. It always occurs in the larger bronchi, more often in males. Soot and smoke have been thought causative factors, and owing to the common use of stoves in Vienna, its apparent frequency there has been attributed to this source. But is it not more probable that the acknowledged primacy in autopsy statistics makes the disease seem more frequent in Wien.

It is doubtful if the diagnosis of primary cancer of the lung can ever be more than hypothesis without the aid of roentgenography and bronchoscopy. In secondary malignancy of the lung, beside the history of primary growth elsewhere, the roentgenographic findings are usually authentic, owing to the appearance of discrete, disseminated mottling. But in primary cancer of the bronchus, invading adjacent glands or lung parenchyma, the roentgenologist often mistakes the pathology for tuberculosis or unresolved pneumonia.

Even at autopsy many cases of primary pulmonary neoplasm have been recorded as tuberculous or inflammatory lesions. Heretofore but one in ten cases of primary carcinoma of the lung have been correctly diagnosed antemorten. They are likewise often misinterpreted as tuberculosis.

Briefly the symptoms of primary carcinoma of the lung are cough, dyspnea, cyanosis, expectoration, hemoptysis, thoracic pain, pressure symptoms from swollen hilus glands, fever and pleural effusion, more often increasingly bloody. A distinction in symptomatology must be made between primary carcinoma of the bronchus and lung parenchyma. When the growth is chiefly limited to the bronchus, cough, expectoration, hemoptysis and symptoms of obstruction, as asthma, cyanosis and dyspnea, are more frequent. With complete obstruction of the bronchus there may be present partial atelectasis; with partial blocking, evidence of emphysema. Fever is quite common and also severe boring pain in any form of primary lung carcinoma, in the side, front, back, shoulder or arm. With cough and continued severe pain in the chest in adults, without other signs of disease, pleural cancer should always be thought of.

There is nothing characteristic about the cough or expectoration in primary lung cancer, but absence of tubercle bacilli in frequent sputum examinations should exclude phthisis, even in the presence of fever which usually misleads one into making this diagnosis. Hemoptysis is frequent but severe hemorrhage, as in this case, very rare. Bronchoscopic examination is by far the most essential diagnostic aid in determining the presence of primary cancer of the bronchus and should always be resorted to, when tubercle bacilli cannot be found in the sputum, in any case of undetermined lung disease, unless contraindicated by special circumstances or complications.

CASE HISTORY

The patient was a tall, thin, sallow female of middle age who entered the County Hospital in June, 1926, because she had been coughing up blood at intervals for over a year. The diagnosis of tuberculosis had naturally been made. There was no fever present and slight cough, except during hemoptysis, and no loss of weight. She had suffered considerable pain in her left side but no abnormal signs were discovered on physical and roentgenographic examination of her lungs. The leucocyte count varied from 8,000 to 12,000 and the red cell count from 3,048,000 on entrance to 2,688,000 after severe hemoptysis, while the hemoglobin diminished from 50 to 30 per cent from the same cause. There was some mucopurulent expectoration, in which no tubercle bacilli were found in six examinations. The Wassermann test was negative and there were no other findings of importance.

She had numerous and severe attacks of hemoptysis in the hospital so that her life was endangered, despite the usual methods of treatment, ice bag, morphine, coagulants and several blood transfusions. Nothing availing, and her hemoglobin reaching 30 per cent, it seemed to me that pressure on the lung might be of service. In the absence of any physical or roentgenographic evidences of disease in the chest, it was impossible to determine which lung to compress. However, after one of her more severe hemorrhages, I found dulness over the upper front of the left lung and asked Drs. Slyfield and Nelson to perform artificial pneumothorax in the left chest. This had an immediate favorable effect, although air had to be introduced four times before the hemoptysis ceased. The patient remained in the hospital six weeks and then asked to be discharged. The diagnosis was marked "undetermined" at this time on her chart.

She re-entered a few days later with another attack of hemoptysis and hemoglobin of 30 per cent. At this time I asked Dr. Waltz to make a bronchoscopic examination. At first he introduced lipiodol which showed some obstruction of the bronchial tree of the left lung in roentgenograms. Later, at a second bronchoscopic examination, he discovered a nodule obstructing the main bronchus suplying the lower left lobe of the lung. I then requested him to make a third bronchoscopy and remove a piece of the growth for biopsy. Dr. O. J. West examined this specimen and pronounced it cylindrical cell carcinoma.

The patient was discharged in December, 1926, for deep roentgen-ray therapy by Dr. L. L. Stephens. The first series of treatments was begun in February, 1927; another was given in May; and in July and September a half series was administered. After this the patient did not appear for almost a year and a half, during which time she did her own housework, although from constant pain she became a morphine addict, taking several grains daily. In February, April and May, 1929, she had from a quarter to one-eighth of the treatment advised because unwilling to come to the office.

I lost sight of the patient after she left the County Hospital in 1926, except for occasional glimpses when she was shown at the monthly meetings of the staff. During this period she became emaciated beyond belief. Her last illness she spent in the County Hospital from October 16 to November 8, 1930, when she died. She was not under my care at this time but was reported as expectorating large amounts of pus, running a low fever, with a leucocyte count as high as 19,200 and red cell count of 4,250,000 and hemoglobin of 70 per cent; quite extraordinary after five years of hemorrhage, sepsis and suffering. The deep roentgen-ray therapy stopped the hemorrhage and ameliorated her dyspnea unquestionably.

I was invited by Dr. Hooker to assist in an autopsy. We found the left lung had been wholly destroyed by the growth and infection with only a shell of pulmonary tissue remaining, perhaps an inch thick. The pleural cavity was entirely obliterated by adhesions. The left lung was replaced by an enormous abscess. The right lung was normal; there was no apparent involvement of the mediastinal glands nor were there metastases in the lymph nodes in any other part of the body. The heart was small and the pericardial sac contained six ounces of clear serous fluid.

A peculiarity noted in all the roentgenograms of the chest, while the patient was in the hospital, consisted in what appeared to be a double outline of the right heart. That is, the normal outline of the right heart was plainly visible and outside this was another contiguous shadow about two inches wide of slightly less density, the contour of which followed closely that of the inner outline of the right heart.

Roentgenologists had suggested various explanations of this appearance, the last being the presence of a cyst situated behind the heart. Dr. George Dock, showing this case before a medical meeting in Seattle, adopted my previous interpretation, unknown to him, of a pericardial effusion. It seems highly improbable, however, that the pericardial fluid found at autopsy was other than a terminal condition, and most roentgenograms of even slight amounts of pericardial effusion exhibit a homogeneous shadow.

This case is chiefly remarkable for its duration. Authorities estimate the average duration of primary lung carcinoma to be from six months to two years. The life of this patient was undoubtedly greatly prolonged and metastases prevented by deep roentgen-ray therapy. But it is a moot question whether a lethal dose of morphine given years before, after the diagnosis had been positively determined, would not have been a more humane form of treatment. Sections made from the lung tissue removed at autopsy were kindly examined by Dr. A. L. Balle who confirmed the diagnosis of carcinoma.

CLINICAL ASPECTS OF DIARRHEA*

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The purpose of this paper is to bring before you a brief resume of the various causes of diarrhea, and to outline the differential diagnosis of the principal and most important types.

Diarrhea is first of all a symptom, the manifestation of some factor, either inside or outside of the gastrointestinal tract which, by its action upon the mucosa of the stomach or intestine, or by its influence upon the nerve mechanism, causes a disturbance in the secretions and motility of these organs, resulting in an excessive number of bowel movements of more or less liquid consistency. It is to be regretted that the average physician or surgeon too often ignores the question of diarrhea, quite frequently considering it a clinical entity and overlooking the fact that it is a guide post to the much more serious primary factor.

CLASSIFICATION

In the accompanying tabulated classification I have attempted to set forth in the clearest possible way the more common types of diarrhea with which we are likely to come in contact from time to time. The intrinsic group takes in all those things acting directly upon the otherwise normal gastrointestinal mucosa, bringing about the condition of diarrhea. The extrinsic group includes those factors which affect the nerve mechanism of the bowel and includes atrophic changes.

I. Intrinsic causes:
  1. Dietary indiscretions and food poisoning. a. Cholera morbus, b. diarrhea of infants, c. ptomaines, d. infected foods.

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* Read before a meeting of Clark County Medical Society, Vancouver, Wash., Dec. 8, 1930.

2. Dysentery. a. Bacillary, b. amebic.
3. Colitis. a. So-called mucous type, b. true mucous colitis, c. chronic ulcerative colitis.
4. Diverticulitis.
5. Tuberculosis.
6. Malignancy of colon and rectum.
7. Gastrogenic.
8. Typhoid fever.
9. Drugs. Arsenic, mercury.
10. Gastrocolic fistulae.
11. Chronic nephritis and uremia.
12. Hepatic cirrhosis.
13. Cardiac decompensation.
14. Pernicious anemia.
15. Pancreatic disease.

II. Extrinsic causes:
1. Exophthalmic goiter.
2. Pellagra.
3. Functional. Emotional states, senile changes.
4. Idiopathic.

CLINICAL FORMS

I have placed dietary indiscretions and food poisoning first because the average of us come in contact with this type more often than with any other kind of diarrhea. Those who treat infants and children will see it daily; improper feeding is the chief cause. The old fashioned so-called "cholera morbus" is seen quite frequently during the summer in the rural districts and is usually due to improper diet, infected food stuffs, or at times to the ingestion of large quantities of over-ripe fruit. The nature of the stools in these cases is usually of the lienteric type and the diarrhea responds well to a free purge, bland, soft or liquid diet and bismuth.

Quite frequently we read of or observe an outbreak of food poisoning which is written up by the lay press as ptomaine poisoning. These outbreaks are usually caused by eating oysters or other sea food infected by the bacillus enteritidis of Gaertner which he first described in 1888. These cases are extremely ill and have an acute gastroenteritis, severe watery bloody diarrhea and profound toxemia. The treatment is purely supportive.

Dysentery, as seen in this country, is usually of the amebic form. Of the bacillary form, suffice it to say that it is a self-limited disease due to the Shiga-Kruse-Flexner group of organisms, characterized by sudden onset, running a course of four to six days, during which time the patient passes ten to twenty stools daily, containing large quantities of blood, mucus and pus. The diagnosis lies in ruling out amebic and ulcerative colitis, recovery of the organisms from the stool and, most important of all, a positive agglutination test in about six days from the onset.

True amebic dysentery is rather common, especially in the seaport towns of the United States and closely resembles bacillary dysentery except that it tends toward chronicity and relapses. A conclusive diagnosis is reached by recovery of the entameba hystolytica from the fresh warm stool. Proctoscopic examination and roentgenograms are not differential. This disease responds best to the arsenicals such as treparsol; emetin is also used.

The term colitis has been greatly popularized of recent years and it is to be deplored that the charlatans and quacks have reaped a harvest through this fact alone. The present day curriculum of our medical schools does not include adequate instruction on affections of the colon, and not until a short time ago did research workers begin to study pathologic conditions of the colon. True mucous colitis, though being a clinical entity, is nevertheless relatively rare. Ewald called it "myxoneurosis intestinalis" which seems to be a very fitting name, since it frequently occurs in highly nervous, more or less neurotic individuals and is characterized by passages of large jelly-like mucous casts, usually mistaken by the patient for pieces of the bowel lining.

The present day popular term "mucous colitis" is being used largely to describe a condition in that group of patients, usually females, who come complaining of intermittent attacks of diarrhea, interspersed with rather severe constipation, vague shifting abdominal cramp-like pains, mucus in the stools, and who for years have had a chronic laxative habit. This is the type of patient who has traveled from one clinic to another, who has consulted the various cults and because of her neurosis is most difficult to treat. The history is usually conclusive, but to avoid pitfalls it is advisable in each case to examine the stool for three successive days for blood, pus, parasites and tubercle bacilli; to examine the rectum and sigmoid through the sigmoidoscope and finally to make roentgenograms of the colon by means of the opaque enema. Should all findings be negative, one is justified in giving the patient a fair trial on medical management, which in most cases consists of a bland, smooth anticonstipating type of diet, scale agar or psyllium seed, mineral oil, large quantities of water, exercises, and an attempt to help the patient adjust herself to a more rational form of life. No laxatives or other forms of local treatments are used except an occasional small injection of warm olive or mineral oil at bedtime to be retained until the next morning. These patients usually have an irritable bowel and are made worse by the addition of bran and roughage in the diet.

Fibrous fruits and vegetables are omitted from the diet for the same reasons, or if desired, they can be pureed.

True ulcerative colitis, although having been recognized as such for many years, has only lately been found to be a disease with a specific etiology. Bargen of the Mayo Clinic[1] in 1924 isolated a diplostreptococcus from the bowel of a patient suffering from ulcerative colitis, which organism when injected into rabbits and dogs produced ulceration of the colon and could be rocovered from the lesions so produced. His description of this disease is typical of the majority of cases. "The first attack of acute ulcerative colitis or acute exacerbation of chronic ulcerative colitis is striking and characteristic. The patient is acutely ill, the fever is septic, the abdomen is diffusely tender, there may be cold perspiration, and severe cramps may accompany the frequent rectal discharges of blood, pus and mucus."

At this stage of the disease there are two characteristic findings: (1) Proctoscopic examination reveals a rectal mucosa which is bright red, shiny, and bleeds on the slightest trauma; the lumen of the rectum is also considerably narrowed; (2) the roentgenogram of the colon by means of the opaque enema shows a bowel which in the acute active stage is extremely spastic. It has lost its haustrations and the edges of the shadow are ragged in appearance. The bowel, due to its spasticity, has a tendency to expel the enema very quickly. In the chronic stages the outline of the colon is smooth and haustra are few. These findings, together with an accurate history, examination of the warm, fresh stools for parasites, ova, blood, pus and tubercle bacilli, and finally, which is extremely important, the recovery of the diplostreptococcus from the rectal mucosa taken at the time of proctoscopic examination make the diagnosis evident.

Bargen reports excellent results from treatment of these patients by means of specific serum and vaccines, low residue, high calory, high vitamin diet and such drugs as kaolin, bismuth, paregoric and tribasic calcium phosphate. No irrigations are used, and since the advent of specific serum and vaccine therapy, surgical procedures are extremely rare.

Diverticulosis of the colon is probably more common than is ordinarily supposed. This condition is reported in about 5 per cent of patients subjected to roentgen examinations at the Mayo Clinic. It sometimes causes diarrhea, due to partial obstruction of the bowel by an acutely inflamed diverticulum, and the diagnosis between this condition and a malignant one is usually difficult especially at the first attack. Due to the obstructive symptoms present one hesitates to roentgenize the bowel. A palpable mass is usually present in both conditions but in malignancy one usually finds blood in the stool. Occasionally cancer is superimposed upon a diverticulum.

Rankin and Brown[2] divide diverticula into two main groups: (1) Those patients having diverticula of the colon, discovered accidentally and which have no bearing on the patient's complaint, and (2) true diverticulitis with the various complications, such as obstruction, abscess formation, fistula, perforation, etc. They also found in reviewing a series of 227 cases, that 60 per cent, or 142 cases, complained of alternating diarrhea and constipation, while 11 per cent complained of diarrhea alone. This was not a true diarrhea but more of a rectal tenesmus and frequent urge to go to stool with the passage of only a small amount of mucus and pus. The condition exists almost entirely in persons of middle age, especially those who are leading sedentary lives. The medical treatment in acute cases consists of a complete rest in bed, high warm saline enemas, glucose intravenously, residue, free diet and ice bags to the abdomen. When the acute stage has receded and the patient's condition warrants it, the diverticulum should be explored and resected if advisable.

Diarrhea, due to a malignant condition of the bowel, is not the rule, if one excludes cancer of the rectum; on the other hand, gradually increasing constipation is the usual thing. Malignant growths of the rectum and rectosigmoid, however, due to their position and their proximity to the sensitive sphincter, usually provoke sufficient irritation, especially if they are producing obstruction, to cause frequent discharges of mucus and blood. Digital or proctoscopic examination readily reveals the condition. Too many such cases are overlooked, due to failure of the physician thoroughly to examine the rectum and sigmoid. The diarrhea itself is usually continuous, not intermittent, as in mucous colitis or irritable colon, and the patient frequently complains of tenesmus and pain following the movement. Quite often the discharge consists of pure blood.

There are two forms of tuberculosis which may cause diarrhea. The most important of these and probably the one most commonly seen is the ulcerative form, either primary in the intestine as such or secondary from the swallowing of sputum from a tuberculous lung. There is nothing characteristic about this type of diarrhea. It is usually intermittent in character, not particularly severe, and the diagnosis is made by finding tubercle bacilli in the stool and verified by guinea pig inoculation. The other form of tuberculosis which may cause diarrhea is the hyperplastic type in the ileocecal region. This is relatively rare and is frequently mistaken for appendicitis, due to the intermittent attacks. The roentgenogram shows a filling defect and usually a cavity formation. It usually occurs in patients under forty years of age.

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[1] Bargen, J. A.: Experimental Studies of Chronic Ulcerative Colitis. J. A. M. A., 83:332, Aug. 2, 1924.

[2] Rankin, F. W. and Brown, P. W.: Diverticulosis of the Colon. S., G and O., May, 1930.

Regarding the gastrogenic type of diarrhea, this is due to any of those conditions which cause a gastric anacidity or relatively low stomach acids, as pernicious anemia, late malignancy of the stomach, chronic alcoholic gastritis and occasionally lues. It is purely symptomatic and responds almost at once to the administration of dilute HCl, given in doses of ½ to 2 drams in a full glass of water taken during and after the meal. I believe the common fault in giving this drug is usually insufficient dosage.

There are occasional cases of mild or prolonged low grade typhoid fever presenting diarrhea and persistent fever as the chief symptoms. In spite of our pure food laws and present water supply, this must be borne in mind and stool cultures and agglutination tests will often throw light on an otherwise stubborn and persistent diarrhea.

The drugs mercury and arsenic, if given in excess or over long periods of time, will invariably cause diarrhea. Suffice it to say that withdrawal of the drug and elimination stops the diarrhea.

Gastrocolic fistula, which incidentally is almost always gastrojejunalcolic, is secondary to the formation of a gastrojejunal ulcer following gastroenterostomy and its subsequent rupture into the colon. Both history and roentgenogram are conclusive evidence of the presence of a fistula. First we have the history of a short period of relief following gastroenterostomy, then the return of the same type of trouble which would suggest a stomachal ulcer. This may continue for a variable length of time when diarrhea develops, a lienteric diarrhea coming on shortly after meals and due entirely to the passage of acid stomach content and partially digested food directly into the colon. The patient usually wastes away very rapidly; the treatment is surgical.

There are a few conditions other than local disturbances of the gastrointestinal tract which are frequently responsible for diarrhea; we have called these extrinsic causes. The chief one of these is exophthalmic goiter. Unless we keep in mind those rare cases, whose first symptoms are those of a more or less severe gastrointestinal crisis, we are apt to overlook the true cause of the trouble. The true thyroid crisis is a well defined condition. The patient usually, but not always, presents the exophthalmos, the tremor and the smooth enlarged gland, plus severe continuous vomiting and at times delirium and great restlessness; with this syndrome there may be marked watery diarrhea. On the other hand, there are those occasional cases of hyperthyroidism without all the classic signs of Grave's disease who come complaining of a persistent diarrhea and nothing else of note. A careful history may bring out the fact that there has been some weight loss and restlessness, frequently beginning soon after some emotional disturbance or financial reverse. Further investigation and repeated metabolism tests will clear up any element of doubt. I have seen two such cases recently. Surgery, after a course of Lugol's, is the treatment of choice.

Of pellagra there is little to say; it is rarely seen in this portion of the country. However, I believe the original classic description of pellagra holds as nearly true to form as that of any of the better known diseases; herein I refer to "dermatitis, dementia and diarrhea." The high ketogenic, high vitamin diet has been used with great success.

In making a diagnosis of functional or idiopathic types of diarrhea we must have absolutely ruled out all possibilities of gross lesions in the entire gastrointestinal tract or any constitutional disease which might be responsible; the principal ones I have touched on in this paper. There are, however, those individuals who might be catalogued as sympathicotonics who may, under emotion, excitement, extreme temperature changes or mental strain, develop attacks of diarrhea lasting days or weeks and who may or may not recover spontaneously. It is plainly a dangerous thing to make this diagnosis without exhaustive and complete studies. Various things have been tried, among which are physiotherapy, change of occupation and elimination of foci, but at best the results are unsatisfactory.

There are several conditions in the original outline which have not been discussed for the principal reason that these are quite obvious, with the exception possibly of pernicious anemia. It might be said that about 50 per cent of cases of pernicious anemia have diarrhea at some time during the course of the disease. Cardiac decompensation and hepatic cirrhosis are self-evident diseases, and cause diarrhea through congestion of the intestinal mucosa.

CONCLUSIONS

Diarrhea is frequently the manifestation of a much more serious process, usually in the gastrointestinal tract. When in doubt about the cause of a diarrhea the physician should examine the warm, fresh stool for parasites, ova, blood, pus and tubercle bacilli. Cases of true mucous colitis are rare but the irritable colon with alternating attacks of constpiation and diarrhea with the passage of considerable mucus is of frequent occurrence.

HENOCH'S PUPURA IN RELATION TO ALLERGY*

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The skin lesions of purpura are sometimes classified with the vasomotor eruptions, such as erythema, angioneurotic edema and urticaria. Briefly there are at least two essential elements in the etiology of this large group. The first is a susceptibility of the patient, a peculiar sensitiveness, making possible the operation of the second factor which in most instances seems to be a toxin. For example, there are persons in whom the sting of a bee produces no lesion. No susceptibility exists. Some who have been stung by a number of mosquitoes reach a point where annoyance ceases. Susceptibility has been removed and immunity established. On the other hand, there are those in whom the ingestion of the minutest quantity of a certain food will produce extensive skin manifestations.

This, of course, is elementary. The consideration of circumstances and agents which modify susceptibility must be inclusive. Vitamins must be taken into account. They play a vital part in scurvy and pellagra. A liability to allergy is induced by chronic bacterial infection represented in foci. Endocrines also must be considered.

As affecting allergy the factor of heredity is being recognized as a powerful determinant. This phase of the subject has been discussed recently by several writers. Williams[1] deals interestingly with the subject, quoting from two sources of statistics, Cooke[2] and Balyeat,[3] in the following summary. "In a study of 1117 normal university students it was found that a positive family history of hay fever and asthma occurred in only 8.3 per cent, which is in marked contrast to such a family history found in 60.1 per cent of patients suffering with hay fever and asthma. Balyeat believes the tendency is inherited as a simple dominant. It is to be noted that the importance of heredity in this group is based on diseases, the allergic character of which is unquestioned, viz., hay fever and asthma. The statistics of both these observers were similar and both noted in these allergic families an abnormally large percentage of cases of urticaria, Quincke's edema and eczema, diseases which in many instances are now proved to be allergic."

In his time Osler[4] was particularly interested in the hemorrhagic diseases and as long ago as 1914 his marvelous insight prophesied that an anaphylactic cause might be proved in connection with certain purpuras. Hints in this direction have been made by others since that time but only in the past few years has definite clinical evidence been published in American literature.

Alexander and Eyerman[5] in 1927 reported five cases of Henoch's purpura caused by food allergy and again two years later six additional cases. The ages of these patients varied from five to fifty-two years. The offending foods were wheat, milk, egg, rice, potato, chicken, beans, red plums, pork, onions and strawberries. In some instances, as with bread in one case, a large amount of the food-stuff, in others a minute quantity was required to produce the symptoms. Some of the cases were associated with asthma and hay fever; a few gave a definite family history of allergy.

Certain of these patients yielded positive skin reactions which aided in tracing the foods implicated. In others this had to be determined by experiment, eliminating one food after another, then observing the effect of feeding the suspected article. Two additional patients were mentioned showing purpura with allergy, in whom no particular foodstuff could be incriminated.

It is in this connection that the following case history is presented. Among other points it illustrates the difficulty encountered in the study of an ambulatory patient who visits a busy practitioner at infrequent intervals.

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* Read before Pierce County Medical Society, Tacoma, Wash., Nov. 25, 1930.

[1] Williams, C. M.: Archiv. Dermatol. and Syph., Vol. 21, No. 5, May, 1930.

[2] Cooke, R. A.: Med. J. and Rec., 122:537. Nov. 4, 1925.

[3] Balyeat, R. M.: Am. J. M. Sc., 176:332. Sept., 1928.

[4] Osler, W.: Brit. Med. Jour., 1:517. 1914.

[5] Alexander, H. S. and Eyerman, C. H.: Arch. Dermatol. and Syph., 16:322. Sept. 1927; J. A. M. A., 92, 25 p. 2092. June 22, 1929.

Woman, single, age 52. Father died at 83, had asthma twelve years; one sister had asthma but recovered after change of climate. Whooping cough as a child left the patient delicate; always underweight. All other members of the family are heavy. Had inflammatory rheumatism in 1918, a mild case, in bed three weeks. Repeated attacks of respiratory infections all through life.

Asthma began at the age of 33. Attacks always followed a cold, but stomach was always out of order when she had asthma. Changes of climate have never been helpful. A winter in Honolulu was attended with asthma constantly and resulted in a loss of weight. After returning home was free from it for a year, but had inflammatory rheumatism.

At age of 41 the attacks of asthma began to be always attended with colds and "bilious attacks." This was the time of first consultation, 1919.

Her weight was 105, 45 pounds less than her best weight at age 36. Blood pressure was 82/50. Tonsils were septic and one apical abscess was revealed by roentgenogram. Polyps were removed from left nostril within a week. Tonsils were removed within a month. The next month she gained thirteen pounds. Asthma continued at times, but she was benefited by vaccine treatment.

In March, 1920, on account of having had attacks typical of gallbladder colic she underwent cholecystectomy and appendectomy. Two good sized gallstones were found. The appendix showed chronic catarrhal inflammation with obliteration of the distal third. There was marked ptosis of all organs. According to the patient eggs have always caused griping. At this time she was tested for egg, milk, wheat and the protein of staphylococcus. All were negative. Wassermann was negative.

She was not seen again until five years later, 1925. Eighteen months previously she had been very ill with pneumonia and got down to eighty-nine pounds. Emphysema which had been present before seemed greatly altered and fibrosis was recognized in both upper lobes, more in the left. At this time she was convinced that the origin of her asthma was in her digestive tract.

Complete fluoroscopic examination showed marked pleural adhesions on right side. The fibrosis was confirmed, especially marked in left upper and right lower lobes. Extreme ptosis, gastric and colonic. Negative for cancer or ulcer, kinks or obstructions. Blood urea and blood chlorides were found normal.

Her next appearance was three years later, 1928, when the dermatologic history begins. In September, 1927, she had had severe infections of three fingers, "like felons." All had to be lanced. After four months they were healed but an eruption immediately appeared, first on buttocks, then in the joint regions, then all over body. The lesions were elevated, dark, surmounted by a vesicle, were arranged in groups resembling dermatitis herpetiformis. Many of the lesions suppurated, some requiring incision. All persisted as pigmented scars for considerable time. This was accompanied with rheumatic swellings about the joints and with pain in the upper abdomen, in entire upper third. This abdominal pain was relieved only by strict milk diet. The blood count was hgb. 82 per cent, reds 4,750,000, leucocytes 11,000, with 76 per cent polymorphonuclear neutrophiles and 14 per cent eosinophiles. A week later there was a definite purpura upon the legs, large lesions, irregular in outline, more or less symmetrical, while the other lesions persisted.

The patient had been in the habit of taking phenolphthalein regularly. After two or three months of eruption this was discontinued and the eruption entirely disappeared as reported five months later. She had also passed two winter months as usual without asthma. Again went through a period when foods began to disagree and cause pain and her asthma returned. The eruption had also begun to recur. The worst attack followed the eating of ham and beef stew. Allergic tests were now made with twenty-four groups of proteins. Beef, lamb, pork, veal and mutton showed two plus. Milk, eggs, cheese showed one plus. Pneumococcus and streptococcus showed one plus.

Again she remained away for more than a year. In June, 1930, she insisted on another gastrointestinal study on account of severe pains in upper abdomen whenever any food was introduced into the stomach. The roentgen study was entirely negative. Fractional gastric analysis was normal and there was no blood in the gastric contents.

She had made attempts to avoid the foods to which she had showed sensitiveness but had not been able to see definite benefit. Not sufficient emphasis had been placed upon this point in her instructions. The legs became covered with purpura. The joints had been sore all this time and asthma had existed off and on since winter. More polyps had been removed from her nose and the specialist believed the asthma to be due to infection of the accessory sinuses. Roentgenogram showed both antra cloudy. Blood count at this time showed 42 per cent eosinophiles. The platelets were not counted, but the number seemed to be normal. Blood calcium was 550, a normal figure. Patient was advised to omit from diet one thing after another that had given an allergic reaction. A month later she phoned that all symptoms had subsided, while on a diet strictly free from egg.

The next month she refrained from beef, pork and egg; gained four pounds, no asthma, no eruption. Ate a piece of cake and broke out with three or four purpuric spots. Another month's freedom from symptoms was interrupted by a large spot on the ankle after eating corned beef hash. Two weeks later had an attack of asthma after partaking of refreshments at a party.

It is possible that this patient manifests allergy to one foodstuff at one period and to other foods at other times.

Never had a hemorrhage from a mucous membrane appeared, not even epistaxis. Even when her gastrointestinal pains had been worst there had never been a tarry stool. At the time of her operations she showed no tendency to bleed. The eosinophilia in this case is notable. In the reports of a large number of bloods in the blood dyscrasiae I have been able to find only one case of eosinophilia which will be mentioned later.

Blood studies in purpura of various types have been more intensive in late years in an effort to clarify the subject. Osler was a pioneer in this country, but the last edition of his textbook still considers the phenomenon as a symptom.

Clinical classification has been more recently worked out in connection with the blood changes, allowing a place for the symptom as such, and recognizing the condition as a disease. Minot and

Lee[6] have made such an arrangement which, however, is difficult to grasp at a glance and not easily retained in the memory.

The kernel of the difficulty is expressed in this introductory remark, "Purpura or hemorrhage into the skin is often a conspicuous symptom of hemorrhagic conditions, but its causes are manifold. In some cases purpura is due to an abnormal condition of the blood; but more commonly it does not indicate a recognized disturbance of the blood itself. All of these conditions are discussed under the same heading, although it is believed that the underlying causes and the mechanism of production of the somewhat similar symptoms will eventually be demonstrated to be quite different."

Efforts to differentiate these diseases are, therefore, now being made on the general basis of a study of the blood, i.e., whether the case in question is one accompanied by blood changes, or one without demonstrable abnormality in the blood. The elements taken into account in such study are the coagulation time, the character of the clot and its retractibility, the prothrombin, fibrinogen, the calcium content and the number of platelets.

An extensive research published by Rosenthal[7] seems to indicate that the number of platelets is the most important feature in all purpuras which manifest changes in the blood. His paper and its discussion brought out considerable disagreement regarding proper methods of counting platelets. The analysis concludes that purpura may be divided into three main groups: (1) Purpura characterized by a diminution of the blood platelets with or without alteration of their functions, (2) purpura due to some change in the function of the platelets without a diminution of their number, (3) purpura due to changes in the capillaries.

The following classification by Lawrence[8] comes nearest to simplicity. It has been rearranged.

I. Idiopathic thrombopenic (thrombocytopenic) purpura, (idiopathic purpura hemorrhagica, morbus maculosis of Werlhof), in which there is marked deficiency in the number of blood platelets.

II. Idiopathic purpura (primary purpura), in which there is no blood platelet deficiency and no other known pathologic disorder of the blood.
   1. Simple purpura; without other signs or symptoms, although urticaria, erythema and edema are often present.
   2. Schoenlein's purpura; simple purpura associated with painful joints.
   3. Henoch's purpura; characterized by abdominal pain which may or may not be associated with joint symptoms or purpura. There may be gastrointestinal hemorrhage.

Idiopathic purpuras are so classified because of hitherto unknown etiology.

The more common purpuras due to recognized cause are similarly classified as:

I. Symptomatic purpura with blood defects, the larger number of cases being thrombocytopenic.

II. Symptomatic simple purpura. As in the simple idiopathic type no blood changes can be demonstrated.

The simple purpuras can be as protean as those with blood defects, and just as violent. In fact, purpura fulminans has occurred without definite blood changes.

This all leads to the supposition that there may be one class of toxins or other causes which lead to blood changes, making purpura possible, and another class of toxins or other causes which bring about similar phenomena through changes in the capillaries or in the vasomotor nerves. Although some studies would tend to show that these changes in the capillaries are anatomic, this can by no means be indubitable. At least the evanescent character of some of these vasomotor skin lesions, and their prompt response to vasomotor constrictors, such as adrenalin in serum-sickness, or to the administration of alkalies in certain cases and of acid bodies in other cases of urticaria would tend to indicate that the capillary changes are functional and under the control of the nerves.

Henoch's purpura, as manifested by eruption, joint involvement and terrific abdominal pains, illustrates in a superlative manner the violent effects of a toxin in the presence of susceptibility. Add to these symptoms asthma coincidentally and there is present a disease of such dimensions as to be astounding, especially if the toxin be so trifling as a morsel of egg or beef. The joint symptoms have no explanation. The abdominal pain has been attributed to local edema and congestion, which conditions have been found in some of these cases subjected to operation under the diagnosis of appendicitis. Sections of intestine have been found cylindrical, swollen and rigid. The patient here reported was undergoing severe abdominal pains when fluoroscoped. No such vasomotor or muscular phenomena were observed.

As regards eosinophila, Lawrence[9] mentions a case of eosinophilia in purpura but it was the thrombocytopenic type. Eosinophilia is frequent in asthma and in ascariasis rises to a high percentage.

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[6] Minot, Geo. R. and Lee, R. I.: Nelson's Loose Leaf Med., Vol. IV, p. 127.

[7] Rosenthal, Nathan: Jour. Lab. and Clin. Med., Vol. XIII, No. 4. Jan. 1928.

[8] Lawrence, John S.: Med. Clin. N. A., Boston, Vol. 13, No. 1, 1929.

[9] Id.: loc. cit.

Pilot[10] reports a case of allergy in a physician, giving a positive skin test with extract of ascarides and developing asthma from exposure to the dust of the dried and pulverized worms.

The first eruption presented by this patient deserves a brief mention. It was herpetic and grouped like dermatitis herpetiformis. Bondurant[11] reports two cases of phenolphthalein dermatitis with a discussion of the subject. He describes the lesions as "beginning as pink to bright red or even a deep purplish hue and finally resulting in a protracted pigmentation of a more or less permanent nature. . . . there may be vesiculation with superficial ulceration." The identical eruption reappearing several months after withdrawal of phenolphthalein led to the conclusion that it was dermatitis herpetiformis. A period of arsenical treatment was followed by cessation of the eruption, but when the widespread purpura appeared it was accompanied by the original lesions. Osler[12] in his work on purpura described necrotic areas with intense infiltration of blood and serum, bullae, and necrosis of the superficial layer of skin. The conclusion must be that all of these lesions were purpuric.

Since the introduction of the cutaneous tests in connection with asthma by Walker some years ago, the subject has had a fascination for the profession, but lately the practical value of the tests has been questioned. There are those who frankly admit their lack of reliability. Feinberg[13] concludes that there are many limitations to the value of skin tests in allergy and the difficulties may be met by other methods of testing, by clinical trials and elimination diets, by a broad knowledge of the clinical correlation and clinical experience in allergy, and by a willingness on the part of the clinician to consider other causes than allergy.

In a study of comparative value of various forms of cutaneous tests Ramirez and Eller[14] admit the discouragement of numerous dermatologists in the use of these tests. They say the tests must be repeated, allowance made for refractory state of the patient, and they report that in this study 200 to 400 tests were done on each patient! A way out of the maze is suggested in an article by Petow and Wittkower[15]. They conclude that skin tests have been overvalued; report 116 cases of allergic asthma, of which 36 completely recovered and 34 were considerably improved by treatment indicated by allergic study; but they encourage the busy doctor to avoid the labor and confusion of the cutaneous tests because peptone and tuberculin used as nonspecific desensitizers gave favorable results in 60 per cent of cases, exactly the same proportion as they succeeded in relieving by specific treatment based on allergy.

SUMMARY

1. Allergy in relation to purpura and to other diseases is reviewed.

2. A case history of Henoch's purpura associated with asthma of nineteen years duration is offered, possibly illustrating allergy.

3. A possible method of management is mentioned which may obviate cutaneous tests.

DIURETICS AND MYOCARDIAL EFFICIENCY*

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PORTLAND, ORE.

The choice of diuretic to be used to relieve edema due to cardiac failure should offer no difficulty. Correct interpretation of immediate effect and duration of that effect is often erroneous. Too frequently the statement is made that a diuretic, given to the same patient at different periods, is more successful the first few times than it is during administration later in the disease, the blame being laid to the diuretic. Statistics have even been presented to show the relation of various diuretics to structural heart change. Such statements and statistics fail to take into consideration the true significance of the symptom edema.

Edema arising during the course of cardiac disease is an indication of myocardial insufficiency and occurs irrespective of the pathologic condition present in the heart. Hence we may see it as a complication of hypertensive heart disease, arteriosclerotic heart disease, organic valvular heart disease, congenital heart disease, etc. In considering the action of various diuretic agents and the benefit to be derived therefrom, one must constantly keep in mind the condition of the heart muscle and, given a reasonably sufficient myocardium, any diuretic should produce satisfactory results. Similarly, as the myocardium becomes more and more insufficient, diuretics have less and less effect. This is true whether or not one considers immediate or lasting effects.

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[10] Pilot, Isadore: Med. Clin. N. A. Chicago, Vol. 12, No. 1, July, 1928.

[11] Bondurant, C. P.: Urol, and Cutan. Rev., Vol. 30, No. 10. Oct., 1926.

[12] Osler, W.: loc. cit.

[13] Feinberg, S. M.: J. A. M. A., Vol. 95, No. 22, Nov. 29, 1930.

[14] Ramirez, M. A. and Eller, J. J.: J. A. M. A., Vol. 95, No. 15. Oct. 11, 1930.

[15] Petow, H., and Wittkower, E.: Klinische Wochenschrift, Berlin, 9:1705-1752. Sept. 13, 1930.

* From the Department of Medicine. University of Oregon Medical School.

The first therapeutic principle in managing any case of edema is to put the patient into as nearly a basal condition as possible. The diet allowed and the amount of fluid and salt restriction is a matter of individual concern. The first attack on cardiac edema is by the administration of a therapeutic dosage of digitalis, regardless of the rhythm, and it is common experience that bed rest and digitalis are sufficient to relieve many cases. This is particularly true of those who are experiencing their first break in compensation.

In cases unrelieved by bed rest and digitalis it becomes necessary to resort to the so-called specific diuretics. Of these the xanthine group is an important one and, until the advent of the mercurial diuretics, was used frequently and with success. Today, with our desire for more rapid action, we are inclined to resort to the more rapidly acting drug, yet the proper use of theocin was and can be attended by a rather vigorous output of urine. Other members of the xanthine group have obvious disadvantages or are considered more as dilators of the arterioles and, therefore, do not meet the requirements necessary for management of gross edema. The two mercurial diuretics, novasurol and salyrgan, are splendid and powerful agents and of these two, salyrgan is to be preferred because of its less irritating qualities. The action of either may be enhanced by the simultaneous administration of ammonium chloride or nitrate. It is further true that changing from one diuretic to another occasionally gives satisfactory results.

But, regardless of how edema is to be attacked, prognosis is the most important part in treating a heart patient and, while it is gratifying to watch the dropsical condition disappear, it is more important to know how lasting the result is to be. The essential point to keep before one is the efficiency of the heart muscle after compensation has been restored to as near normal as possible and one must not be too concerned with the pathologic condition present. It is true that in syphilitic aortitis with insufficiency the duration of life is short and one can be certain that, as soon as peripheral edema develops, the actual months are numbered. The same cannot be said of a case of hypertensive heart disease, the difference being not one of organic valve change but of myocardial damage. The heart muscle is able to compensate in one case, while in the other it is beyond the limit of pure hypertrophy and compensation. Similarly, all cases of cardiac failure must be considered from the basis of functional efficiency of the myocardium and estimation of the effect of a diuretic must be made with that one point in mind.

Having been successful in managing the first break in compensation, one is confronted with managing subsequent breaks. Herein lies the erroneous feeling that the diuretic is not efficient while, as a matter of fact, it is the heart muscle that is not efficient. With repeated breaks there comes a time when all measures fail and the inevitable ensues.

Given any case of cardiac edema, we have certain procedures to follow so that we may prolong comfortable existence. All of these can be summarized by saying that the patient must be kept within the limit of reserve and our duty is to remove such factors as seem to add a burden to the already deficient heart muscle. Chief among these factors are manual labor, psychic influences, disturbed metabolic functions and infections. Unfortunately it is not possible for many patients with cardiac failure to find work which does not include physical exertion. Nor it is always possible to correct psychic influences. It is possible, however, to discover and correct certain metabolic disturbances and to remove any possible harmful infection. Pursuing such a plan will by no means cure the patient and sooner or later he will go beyond the limit of cardiac reserve and develop edema. Then, again, we must employ such measures as are necessary to get rid of the edema and, having done so, again attempt to put off as long as possible the inevitable "next time."

Obviously edema in a cardiac patient is only one symptom of myocardial insufficiency and must be treated as such. Treatment must be aimed at restoring the heart muscle toward normal and any plan of therapy which includes this idea is justified. Actual dosage and technic of administration are far less important than the result sought and, therefore, obtained.

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LOWERING THE INFANT MORTALITY RATE*

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In discussing infant mortality before a group of Oregon health officers, I consider myself somewhat presumptious in pointing out methods of reducing the infant mortality rate, since Oregon already has a low rate and it is doubtless true that other counties in the state have as low or a lower rate than Marion county. As is true in regard to most public health problems, there are many recognized methods of preventing infant deaths. This paper can only pretend to present a general summary of knowledge which is already recognized as being effective along this line.

The infant mortality rate is the most sensitive index we have of social welfare. It tells us accurately the conditions under which the population and especially the mothers and babies live. In the presence of poverty and poor sanitation, the infant death rate will be high, and where the economic level is superior and sanitation good, as a rule it will be correspondingly low. Babies are most sensitive to improper care, bad housing conditions, excessive heat, communicable diseases, contaminated milk, water and food, dirty dishes, and poor hygiene and sanitation generally.

The economic conditions of a community as well as the intelligence and education of the parents are reflected in the infant death rate of any community. The factors of economics and intelligence, of course, have their influence on the feeding of the child as well as have the general sanitation and hygiene, under which the baby is required to live. Poor parents cannot furnish proper living conditions for their children and many times are ignorant as well. The prevention of infant deaths in this class of the population is difficult.

One of the chief functions of a well organized health department consists in reducing the infant mortality rate. The good accomplished in improved living conditions for the babies also has its beneficial effects on the morbidity and mortality rates of those of older ages.

What are the chief causes of infant mortality? Fundamentally, they are the same everywhere and consist of the weakness of infancy itself, poverty, ignorance and neglect. The economic, educational and moral aspects are very closely tied together. More specifically the underlying causes consist of gainfully occupied mothers, poor housing, excessive heat and humidity, smoky atmospheres, lack of cleanliness, artificial feeding, dirty milk, contaminated water, lack of prenatal care, as well as alcohalism, syphilis and many other diseases.

Infant mortality rates are higher in the cities than in the country as a rule because most of the conditions provoking infant deaths are to be found in the former. The size of the population itself has very little influence, but the hygiene, sanitation and character of the population plays a large part in the number of deaths which occur. High rates are often found in small factory towns, where mothers are gainfully employed. When mothers stay at home, nurse and properly care for the babies, they do not die.

I have listed the chief fundamental causes of infant mortality as poverty, ignorance and neglect. What medical causes of death in infants do these lead to?

Numerous studies have shown that from 70 to 75 per cent of the deaths occurring in infants are due to three main causes, prematurity and congenital conditions, acute gastrointestinal and acute respiratory diseases. The balance of the deaths are due to acute infectious diseases, tuberculosis, syphilus, malformations, etc. Last year in Marion county twenty-seven of our thirty-one infant deaths were due to prematurity or congenital causes and respiratory diseases. There were no deaths from diarrhea and enteritis.

Following this further, we find that prematurity as one of the principal causes of infant deaths is due, on the one hand, to such things as heavy lifting, overwork of the mother, accidents, long rides, emotional strains, etc., and, on the other hand, to conditions of the mother herself, such as syphilis, tuberculosis, heart disease, nephritis, acute infections, all of which influence the condition and nutrition of the fetus.

Respiratory deaths we find are due primarily to overcrowding and poor ventilation which favor the transmission of respiratory infections. Improper feeding with deficiency of necessary vitamins and mineral salts also undoubtedly plays an important part in lowering resistance to these conditions. In Marion county we have more deaths from respiratory infections than from gastrointestinal conditions.

The third principal cause of infant deaths, acute gastrointestinal infections, is due primarily to uncleanliness of food, the contamination, of course, being increased by atmospheric heat and improper methods of handling. Eighty-five per cent of all infant deaths are said to occur in bottle fed babies. This is a startling fact and shows the importance of mother's milk as a means of preventing infant deaths. Artificial formulas, while valuable in themselves, besides being expensive, are difficult to prepare and may, therefore, become contaminated and be a source of infection to the infant. Breast feeding requires but little experience and is a perfect example of securing prevention by making the method easy.

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* Read before the Annual Meeting of City and County Health Officers, Portland, Ore., Sept. 17, 1930.

In the prevention of infant mortality, as in the prevention of any other condition, the problem consists in attacking it at its root, concentrating upon the principal preventable causes and focusing our attention upon the mother. The conditions under which she lives cannot always be easily influenced, especially when economic questions are involved. Good housing conditions cannot always be furnished or a job secured for the untrained breadwinner. But much can be done to see that the milk supply is properly guarded and, where there is intelligence and cooperation, education is of much value.

After safeguarding the milk supply and bringing about good sanitation, we concentrate our attack upon prematurity, respiratory infections and dysenteries as the principal causes of infant deaths and our chief weapon becomes education. In considering this we are always forced back to the subject of prenatal care.

Prenatal care in a public health sense can best be given by making use of the services of public health trained nurses. They are the advance guard of the private physician as well as the health officer. The cooperation of the private physician is absolutely necessary, and to secure this there must be a uniformity of purpose and method between the doctor and the nurse who visits and instructs his patients.

In the prevention of prematurity the nurse should be chiefly concerned with encouraging the mother to go to her doctor early and regularly during pregnancy. She should be equipped to carry out the instructions of the doctor and to instruct the mother in the hygienic measures of pregnancy and the postnatal period, such as avoiding fatigue, heavy lifting, long rides, etc.

On the part of the doctor a few simple routine tests would prevent many premature deaths of infants. Routine Wassermann tests and proper follow-up will help eliminate many of the deaths due to syphilis. Blood pressure and urinalysis at stated periods help cut down deaths in the infant due to heart trouble, nephritis and similar conditions in the mother.

With the hurdle of prematurity past, the infant still has to face the dangers of respiratory diseases and gastrointestinal infections. The prevention of dysenteries consists primarily in using mother's milk, and when this is not possible, in securing the proper sterilization of the artificial formula and of the dishes and utensils used.

The prevention of respiratory diseases in the newborn consists largely of proper nutrition, the securing of proper ventilation and the avoidance of overcrowding with, of course, protection from direct contact with cases of respiratory infection. And in the prevention of both of these, the public health nurse in her visits to homes can fill a most important role.

There are other causes of infant deaths, of course, in addition to prematurity, respiratory infections and dysenteries. Some of them are medical problems, chiefly concerned with good obstetrics and the avoidance of difficult labors with injuries to the baby as well as to the mother. Routine pelvic measurements and noting the size of the child will help prevent deaths due to dystocia. As to communicable diseases, vaccinations will take care of smallpox; toxin-antitoxin will prevent diphtheria and fortunately infants are relatively immune to some of the other diseases of childhood.

In Marion county, where the economic problem is not great, our attack on the infant deaths is largely a problem of proper nursing service to mothers who are under the care of a physician. Some doctors report their prenatal cases regularly to the Health Unit and the nurses. The nurses make regular visits and keep the doctor informed as to untoward symptoms. After delivery they visit the mother and baby at regular intervals. It is true that all doctors are not yet educated, I might say, to the value of this type of public health service. But results have been quite definite. For example, over a period of four years from 1925 to 1929, the infant mortality rates of babies who had received prenatal nursing service was 16.7, as compared to 31.4 for that group which had not been given prenatal care as furnished by public health nurses, working under the direction of the family physician.

Another practice which is carried on regularly in Marion county is the visiting by nurses of every baby, for whom we have recently received a birth certificate. It is true that some of these certificates are received quite late in the baby's life and he may not be seen before he has passed through some of the principal hazards of infancy. But the nurses are enabled by this practice to locate difficult feeding problems, acute infections, etc., after the mother has left the doctor and when necessary she can again refer her back to her physician for proper care.

In reducing infant mortality, nursing service yields big public health dividends. I have already cited figures which illustrate the effect of public health nursing on infant deaths. Some further figures are interesting and give a composite picture of an improved milk supply, control of water and food supplies, improved sanitation, nursing service as well as a general education program in all matters concerning health.

The following infant mortality figures indicate what can be done in reducing infant mortality when proper facilities are at hand. It will be noticed that from 1920 to 1925 there was very little change in infant mortality rate in Marion county. In 1925, however, the Marion County Child Health Demonstration started its work and figures show a drop in infant mortality until 1929, when it was 39.7. So far this year, 1930, it has been 36.7.

Deaths under 1 year	Marion County Number	Rate
1920	45	55.1
1921	40	45.4
1922	66	75.9
1923	39	45.2
1924	52	55.7
1925	46	50.1
1926	37	41.9
1927	42	46.5
1928	34	37.5
1929	31	39.7

It will be noticed also that the principal improvement has been during the first month, as indicated in the following figures:

Deaths under 1 month	Marion County Number	Rate
1920	34	41.6
1921	26	29.5
1922	40	46.0
1923	25	29.0
1924	36	38.6
1925	25	27.2
1926	23	26.0
1927	30	33.2
1928	26	28.7
1929	20	25.6

When a more detailed study is made as to the cause of infant deaths in Marion County, we have the following figures, comparing the period 1920-24 with 1925-29:

	Marion Co. Rate		Oregon Rate	
	1920-24	1925-29	1920-24	1925-29
Deaths under 1 year: Total	55.4	43.3	56.4	49.4
Communicable diseases	2.1	1.6	2.1	1.8
Tuberculosis	0.5	0.2	0.4	0.5
Respiratory diseases	8.7	6.8	9.0	7.8
Diarrhea and enteritis	3.7	4.1	3.9	2.9
Congenital causes	34.1	26.6	32.5	29.0
Accidents and other external causes	0.5	0.5	1.0	1.0
Other causes	6.0	3.4	7.5	6.4

It will be seen that the principal cause as well as the improvement of infant deaths has been congenital causes which includes prematures. There has been very little change either in respiratory diseases or in diarrhea and enteritis. When the figures reach this low level, it becomes difficult to change it further and a death one way or the other influences the rate to a considerable extent. Considerable effort is required to bring about a change when the rates are low.

In the following figures it will be seen that the principal improvement has been during the first month, although the causes of death listed as congenital are still higher in this month than in later periods.

	Marion Co. Rate		Oregon Rate	
	1920-24	1925-29	1920-24	1925-29
Deaths under 1 month: Total	36.9	28.2	36.1	31.3
Communicable diseases	0.7	0.5	0.2	0.1
Tuberculosis	0.0	0.0	0.0	0.0
Respiratory diseases	1.8	1.6	2.1	1.5
Diarrhea and enteritis	0.7	0.2	0.8	0.4
Congenital causes	30.9	24.8	29.6	26.6
Accidents and other external causes	0.2	0.0	0.2	0.2
Other causes	2.5	1.1	3.2	2.5

	Marion Co. Rate		Oregon Rate	
	1920-24	1925-29	1920-24	1925-29
Deaths 1 month and under 12: Total	18.6	15.0	20.3	18.1
Communicable diseases	1.4	1.1	1.9	1.7
Tuberculosis	0.5	0.2	0.4	0.5
Respiratory diseases	6.9	5.2	6.9	6.3
Diarrhea and enteritis	3.0	3.9	3.1	2.5
Congenital causes	3.2	1.8	2.9	2.4
Accidents and other external causes	0.2	0.5	0.8	0.8
Other causes	3.4	2.3	4.3	3.9

The homely methods summarized in this paper, generally accepted but incompletely utilized, do not exhaust the possibilities of preventing infant deaths. There are many others which might be used, such as prenatal clinics and conferences, supervision of maternity homes, as well as extended educational practices. But on the whole most can be accomplished by placing emphasis on premature deaths, respiratory diseases and intestinal infections.

Marion county does not have the lowest infant mortality rate in the state but as long as it continues steadily downward we must be satisfied. This year so far it is 36.7, the lowest yet on record.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of
Oregon, Washington and Idaho

Devoted to the Interests of the Medical Profession
of the Pacific Northwest

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FEBRUARY, 1931

EDITORIAL

THE MEDICAL BIBLIOGRAPHY

Whenever one writes a paper on a given medical topic, he must of necessity consult certain books and medical journals, from which a large proportion of his information will be obtained. If he wishes the paper to present an air of authority, this will be fostered by references to the texts which he has consulted in its preparation. It is customary to publish these references in the form of bibliography at the end of a paper or as foot-notes to each page in which they appear. The latter plan is commonly considered preferable as it offers convenience of reference and the notes are more likely to be consulted by the reader. Sometimes an author attaches to his paper a list of references of considerable length in addition to those mentioned in the text. It is not considered desirable to include these, as usually they are not intimately connected with the substance of the paper and occupy space that might be more profitably employed. The most extensive collection of references will be found in the French thesis, which every graduate from the University of Paris must present before obtaining his degree. Such a paper may occupy months or years in preparation. When completed it will list every publication which has appeared in any language on the subject of the paper. Naturally anything approaching this in completeness is out of place in connection with a paper published in a monthly medical journal. It is desired to emphasize the fact that suitable references elucidating the text are of value in connection with the writing of any paper. They should include the names of authors, titles of papers and the journal or book in which they have been published.

* * *

PROPOSED MEDICAL LEGISLATION

During the state legislative sessions bills, few or many in number, are usually introduced, bearing in some way on the practice of medicine. Such is commonly the experience in the states represented by this journal. The date of this writing is so early in the sessions that little information is available concerning proposed legislation in our three states.

In the Washington legislature great emphasis is being placed on the subject of taxation and so many bills relating thereto are being introduced that it is probable few measures relative to medical practice will be enacted. Several, however, have been introduced which have a greater or less importance for the medical profession. At the last legislative session there was much discussion relative to the establishment of some form of state medicine, which had received a hearing among various groups of people. At this session there appears to be little if any interest in this subject and it will probably not be an issue. A Senate bill has been introduced, and has already been passed by that body, which will reduce from three to two years the period during which suit may be brought for malpractice. Another Senate bill has been presented, whose purpose is to suppress drug peddling and to provide strict penalties therefor. It is reported this narcotic measure is to be proposed in all the states. It does not seek to hamper the physician in his practice.

House Bill No. 79 would require any hospital supported wholly or in part by public funds to accept any patient without regard to school of legally recognized practice by which the patient desires to be treated. The penalty for violation would be the forfeit of the hospital to its rights from exemption of taxation and would be put on the tax rolls on the first of the following March. Since this bill was referred to a committee, whose chairman is a christian scientist, it may attain some undesirable recognition. Another House bill would provide means for the sanipractor to evade the basic science examination. It authorizes the licensing of any drugless physician by reciprocity without examination. The word sanipractic is declared to be interchangeable with naturopathy. The chiropodists have become ambitious. A House bill has been introduced to amend the act relative to chiropody, defining it to be "the examination, diagnosis or treatment, medically, mechanically or surgically of the human foot." This would replace the present definition as being "the surgical, mechanical and medical treatment of bunions, corns, abnormal nails, warts, callouses and all superficial excresences, etc." Under this definition what would happen to the arthritic, syphilitic or cancerous patients whose lesions were manifested in the feet?

Other measures of interest to the medical profession have been presented but the above comprise those which appear to be of the most importance. Next month will appear comments on legislative progress up to that time.

PACIFIC COAST SURGICAL MEETING

Pacific Coast Surgical Society will hold its annual meeting in Seattle and Victoria. At Seattle, February 24-25, will be held clinics covering a great variety of surgical conditions, the program of which will be announced at a later date. Those in attendance will go to Victoria by boat on the 26th. The Victoria program, during the 27th and 28th, will consist of the presentation and discussion of papers. This society has about sixty active members, a large number of whom will be expected to attend this meeting. An interesting feature of this occasion will center about the memory of Dr. William Fraser Tolmie, who was sent to Fort Nisqually in 1833 as a representative of Hudson's Bay Company by Dr. McLaughlin, the first physician in what is now Washington state, who was the agent or factor of that company at Fort Vancouver. Dr. Tolmie brought locust seeds from England which he planted at Fort Nisqually in 1833, which have become vigorous trees. From one of these a gavel has been constructed under the direction of Dr. J. Tate Mason, president of the society. This will be presented to Mr. John Fraser Tolmie, son of the doctor, who is now Premier of British Columbia. It is expected that this will be one of the notable meetings of this organization.

PACIFIC NORTHWEST MEDICAL ASSOCIATION

The Pacific Northwest Medical Association will hold its ninth annual meeting in Seattle June 25-27. The committee of arrangements will be headed by Dr. George Swift, president-elect, the other members of the committee not yet being appointed.

The principal surgical lecturer will be Dr. Dean DeWitt Lewis of Johns Hopkins and the principal medical lecturer Dr. Charles R. Austrian, also of Johns Hopkins. The other speakers will be young, aggressive men. Two new departures will be undertaken. There will be two lecturers on physiology to review important subjects in this basic science. There will be a section on oto-laryngology, the chair of which will be occupied by Dr. Ridpath.

There will be joint sessions in the morning, while the afternoon sessions will be divided into medical and surgical sections. On Thursday evening there will be a smoker, Friday evening a dinner and Saturday evening will be devoted to informal entertainment for speakers and visitors.

The following lecturers have been engaged:

Dr. Charles R. Austrian, Associate Professor of Clinical Medicine, Johns Hopkins.

Dr. H. C. Bazett, Professor of Physiology, Medical School, University of Pennsylvania.

Dr. A. Elmer Belt, Urologist, Los Angeles, California.

Dr. Leo Buerger, Professor of Surgery and Urology at the Medical College of the Evangelists, Los Angeles.

Dr. Samuel R. Cunningham, Professor of Orthopedic Surgery, University of Oklahoma.

Dr. Dean DeWitt Lewis, Professor of Surgery, Johns Hopkins.

Dr. William Dock, Assistant Professor of Medicine, Stanford University Medical School.

Dr. Arno B. Luckhardt, Professor of Physiology, University of Chicago.

Dr. Frederick L. Reichert, Professor of Surgery, Stanford University Medical School.

Dr. Robert F. Ridpath, Professor of Laryngology, Medical School, University of Pennsylvania.

Dr. Leo G. Rigler, Associate Professor of Roentgenology, University of Minnesota.

Dr. Walter M. Simpson, Pathologist of Dayton Clinic, Dayton, Ohio.

Dr. Cyrus C. Sturgis, Professor of Medicine, University of Michigan.

Dr. Owen H. Wangensteen, Assistant Professor of Surgery, University of Minnesota.

Dr. Leslie T. Webster, member of the Rockefeller Institute for Medical Research, New York City.

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MEDICAL NOTES

OREGON

Federation of Professional Societies. Last month a meeting was held in Portland for the purpose of federating Oregon professional societies. There were representatives of the State Medical Society, X-ray Technicians, State Pharmaceutical Association, State Veterans' Association and Graduate Nurses Association. The object of the organization is said to be joint consideration and action on matters affecting the interests of all professional men and women. Special attention will be paid to intended legislation.

Enlargement of Hospital. Plans have been announced for an addition to Emanuel hospital of Portland, consisting of a five story and basement concrete structure with a capacity of one hundred beds. It will include private, semiprivate and three and four bed rooms. The hospital was organized in 1912 as a twenty bed institution. It has increased to a present capacity of 275 patients.

Members of State Board of Health Reappointed. Drs. W. T. Phy of Hot Lake and N. E. Irvine of Lebanon have been reappointed members of the state board of health by Governor Meier. Dr. Albert Mount of Oregon City has also been appointed a member of the board to succeed Dr. W. B. Morse of Salem.

Appointed School Physician. Dr. Jessie Laird Brodie of Portland has been appointed on the staff of the city school division by Dr. Helen A. Cary, medical secretary of schools.

Delegate to Pharmacy Convention. Dr. Ralph A. Fenton of Portland has been appointed one of seven American delegates to the Military Medicine and Pharmacy Convention to be held at The Hague June 1-6.

Hospital Contract Let. A contract has been let for construction of the Portland Clinic hospital at Marquam Hill near the buildings of the University of Oregon medical school. The cost will be $75,000.

Nurse Supervisor Resigns. Miss Agnes Campbell of Salem, supervisor of nurses for the Marion County public health unit, for the past two years, has resigned this position. She has accepted a position as nursing supervisor in Eureka, Calif.

Physician Held Up and Robbed. Dr. J. M. Lowe of The Dalles was held up and robbed by a gunman awaiting him in his garage when he returned home. His assailant told the doctor he needed the money for his family.

Dr. Clarence L. Gilstrap of La Grande was last month appointed county physician and secretary of the county board of health at the January session of the county court.

Dr. W. P. Chisholm, who has practiced for the past year at Lakeview, has located for practice at Marshfield.

WASHINGTON

Verdict Against Physicians. In Spokane last month a prolonged jury trial was conducted in the suit of Dr. W. W. Robinson against a group of physicians who had slandered him, according to his charges. The original number of defendants was reduced by the court to ten in number. The plaintiff charged a conspiracy against his reputation as a result of being disbarred from the use of certain hospitals for the care of his patients, from which he had been excluded on account of alleged unethical practice. The case attracted wide attention both in the medical profession and among the laity. The jury awarded a verdict against the ten defendants with damages to the amount of $30,000. They have asked for a new trial.

Addition Proposed for Hospital. The Cowlitz County hospital, located at Longview, will soon be enlarged by the addition of an eighteen room building. This action has recently been taken by the county commissioners. It will be about sixty feet in length, intended primarily for the benefit of women patients.

Renovation of Hospital. Snohomish General Hospital has been renovated and brought up to date by Dr. J. A. Durant, who purchased the institution several months ago. Since the financing of an institution of that sort is more or less precarious, several lodges and commercial clubs assisted in providing furniture and equipment.

Consolidation of Institutions. The Yakima Surgical Hospital and the Yakima Nursing Home have been consolidated into a new institution which will be known as Yakima Nursing Home and Hospital. It will be maintained under the management of Mrs. A. L. Burtch. It will be nonsectarian and open to the patients of all physicians.

Reappointed to County Hospital. County commissioners of Pierce county have reappointed Dr. Burton A. Brown as superintendent of the county hospital and Dr. A. R. McPhail as medical director of the county sanatorium.

New Hospital Matron. Miss Gertrude Lind has been appointed head nurse at the Sedro-Woolley Memorial hospital in place of Miss Constance Jay, who has recently resigned.

New Harbor Defense Surgeon. Major John M. Weiss arrived last month at Fort Worden which is near Port Townsend, where he will serve as harbor defense surgeon. He was last stationed at Fort Baker, Calif.

Unfortunate Good Samaritan. Dr. R. W. Perry of Seattle recently lost his coat, hat and gloves. His Filipino house-boy in a tender hearted mood invited an intoxicated youth into the house for the night. The above loss of wearing apparel accompanied his morning departure.

Grays Harbor Medical Society recently elected the following officers for the ensuing year: President, Dr. E. B. riley; vice-president, Dr. A. M. Skarprud; secretary, Dr. L. R. Lightfoot, all of Aberdeen.

President of Kiwanis. Dr. J. T. Rooks of Walla Walla has recently been installed as president of the Walla Walla Club of Kiwanis International.

Wedding. Dr. Thomas J. McCain of Omak and Dr. Elizabeth Gunn, Seattle, assistant health officer and inspector of hygiene at University of Washington, were married at Wenatchee December 31.

IDAHO

Resigns from Hospital. Dr. G. G. Espe of St. Maries has withdrawn from the operation of Platt hospital which he has conducted during the past three years. At the same time he resigned from the office of coroner to which he was elected last fall.

New Hospital Superintendent. Miss Georgia Maxwell of Twin Falls has been appointed superintendent of Twin Falls County hospital.

New County Physician. The Bannock county commissioners last month appointed Dr. W. W. Brothers of Pocatello as county physician in place of Dr. J. R. Young who has occupied that position.

New Nurses' Home. There was a formal opening last month of the Nurses' Home of the Pocatello General Hospital, which is being completed at a cost of $50,000. It is a conveniently arranged and well equipped building, designed with modern arrangements for a nurses' home.

Dr. W. T. Drysdale, who has practiced at New Plymouth for more than twenty-five years, has left that city for Augusta, Maine. A reception was given to him by leading citizens of the city who expressed their affection and confidence in him, following acquaintance of more than a quarter century.

Appointed County Physician. At a meeting of the Payette county commissioners last month Dr. M. R. Fox of Payette was appointed county physician.

Appointed Medical Adviser. Dr. R. L. Nourse of Boise has been apointed staff medical adviser to the commissioner of public welfare.

Dr. E. H. Fields, who has practiced for some time at Kendrick, has moved to Genessee where he will be located for the future.

OBITUARIES

Dr. W. Carlton Smith of Salem, Ore., died December 24 at Portland, following an operation, aged 54 years. He was born at Jefferson, Ore., in 1874. After graduating from Willamette University he studied medicine at the University of Oregon, graduating in 1898. He located at Turner where he practiced until 1902. He served as demonstrator and professor of anatomy at Willamette University Medical School for ten years, at the same time being secretary of the faculty. During the World War he was commissioned first lieutenant, reaching the grade of major at the close of the war and promoted to the rank of lieutenant-colonel in the officers reserve corps. He was in command of the 363rd field hospital, which unit he took to France in 1917. He served in the Oregon House of Representatives in the 1929 session and was reelected last fall for a second term.

Dr. John Wesley Gue of Caldwell, Ida., died at Boise December 26 from arthritis and anemia, aged 60 years. He we born in Illinois in 1870. He graduated from the Georgetown University Medical School, Washington, D. C. and served an internship at Portland, Ore. He began practice at Hailey, Idaho. After a year and a half he moved to Custer, later being a surgeon at the copper mines at McKay. In 1905 he settled at Caldwell, where he practiced until his death. He was prominent in business and social affairs of this city, being a large property owner. He was devoted to athletics, having special interest in those of the public schools.

Dr. Samuel F. Price of Jerome, Ida., died January 12 at a hospital in Twin Falls of septic infection, aged 66 years. He was born in Missouri in 1864. He graduated from University of Michigan Medical School in 1891. He practiced for a time at Hillsdale, Kan., later locating in Wyoming. He then moved to Ririe, Idaho, where he practiced for eleven years, locating at Jerome a little over a year ago.

Dr. Darwin Richard Stockley of Cove, Vashon Island, Wash., died December 29, aged 76 years. He was born in New York in 1855. After completing his education he was for many years instructor at Mankato Normal School, Mankato, Minn. In 1892 he graduated from the College of Physicians and Surgeons at Chicago. For eighteen years he practiced at Evanston, Ill. In 1910 he located at Cove, where he had many friends and admirers throughout the Island.

REPORTS OF SOCIETY MEETINGS

OREGON

COOS-CURRY COUNTIES MEDICAL SOCIETY

Pres., R. H. Mast; Secty., J. W. Simpkin

A meeting of Coos-Curry Counties Medical Society was held at Marshfield January 7, at the Chandler hotel.

Dr. J. D. Rankin of Bandon read a paper on Meckle's diverticulum, which was freely discussed. A discussion followed on acute intestinal ailments.

POLK-YAMHILL-MARION MEDICAL SOCIETY

Pres., S. C. Knott; Secty., W. W. Baum

The annual meeting of the Polk-Yamhill-Marion Medical Society was held at Salem Tuesday evening, January 6.

PROGRAM

"Errors Committed in Surgery of the Stomach," by Dr. M. E. Steinberg of Portland. Discussion opened by Dr. D. R. Ross of Salem.

Dr. Knott, as retiring president, gave a short talk on "Some Present Day Problems of the Small Town Doctor."

The following officers were elected: President, R. L. Wood, Salem; vice-pres., L. A. Bollman, Dallas; secretary-treasurer, W. W. Baum, Salem; councillors, W. H. Barendrick, McMinnville, R. T. Boals, Salem, and G. C. Knott, Independence.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., N. W. Jones; Secty., H .P. Rush

A regular meeting of Portland City and County Medical Society was held in the Auditorium of the Medical-Dental Building, January 7.

A symposium was presented on the subject of epilepsy. Dr. M. L. Margason read a paper on the history of the disease as well as its surgical treatment. Dr. Laurence Selling discussed its medical aspects. Dr. Frank E. Menne read a paper on pathology of epilepsy.

WASHINGTON

CHELAN COUNTY MEDICAL SOCIETY

Pres., J. E. Gahringer; Secty., A. E. Gerhardt

Chelan County Medical Society held a meeting at Wenatchee January 14 with sixteen members in attendance.

The following officers were elected for the ensuing year: President, R. T. Congdon; vice-president, L. M. Mares; secretary-treasurer, A. G. Young, all of Wenatchee.

CLALLAM COUNTY MEDICAL SOCIETY

Pres., William Douglas; Secty., W. H. Taylor

Clallam County Medical Society held a meeting at Port Angeles January 13.

The following officers were elected for the ensuing year: President, R. S. Hamilton; vice-president, D. H. Brown; secretary-treasurer, W. H. Taylor. Delegate to state medical association meeting D. E. McGillivray and R. S. Hamilton alternate.

Matters of business were discussed. Representatives from other cities were also in attendance.

KING COUNTY MEDICAL SOCIETY

Pres., D. H. Houston; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, January 5, President D. H. Houston presiding. About 350 members were present. Minutes of the meeting of December 1 were read and approved.

The following applicants were elected to membership: R. P. Carter, F. R. Dempsay, M. P. Dorman, H. H. Green, F. M. Hardy-Smith, R. J. Hauschel, C. R. Jensen, H. V. Larson, Byrom Newsom, A. M. Osten, E. B. Parmelee, H. N. Rosengreen, W. B. Seelye, W. W. C. Sims, Souren Tashian, C. H. Weir.

Reports from standing and special committees were presented as follows: Program committee, L. J. Palmer; bulletin advisory, H. C. Olmsted; city health, C. E. Hagyard; ethics, G. W. Beeler; membership, H. G. Wright; University extension, D. C. Hall; entertainment, O. S. Proctor; hospitality, P. C. Gunby.

A report of the activities of the Emergency Telephone Exchange was read and approved.

The financial report for the past year was read by Secretary-Treasurer A. J. Bowles.

President Houston delivered an address, giving a brief resume of the society's activities during the preceding year. He thanked the society and board of trustees for their cooperation. He reviewed the work of the telephone exchange and expressed disapproval of the establishment of competitive exchanges. He extended a welcome to the incoming president, Dr. R. J. McCurdy.

The following officers were elected for the ensuing year: President-elect, Frederick Slyfield; secretary-treasurer, A. J. Bowles; trustees, C. W. Shannon and H. G. Wright. Delegates to state meeting, H. E. Coe, A. H. Peacock, E. W. Young, C. E. Watts, O. A. Nelson, A. T. Wanamaker, A. O. Loe, Frederick Slyfield, W. C. Speidel, F. J. Clancy and Roger Anderson.

Dr. McCurdy, incoming president, spoke briefly of plans for the work of the ensuing year, outlining some of the objectives to be attained and promoting the interests of scientific medicine.

The meeting of the Medical Section of the society was held January 12, with Dr. Fred Slyfield presiding.

Dr. J. A. Bargen of the Mayo Clinic presented an illustrated paper on the management of "Ulcerative Lesions of the Large Intestines." These are divided into chronic ulcerative colitis, tuberculous, amebic, neoplastic, diverticulitis, of which the neoplastic are the most common. Discussion of the paper was limited to chronic ulcerative colitis. These cases are characterized by stools of narrow caliber, purulent and bloody. The characteristic picture presents bleeding, inflamed, swollen granular mucosa. The diffuseness of the mucosal swelling and granulation is pathognomonic in contrast to the patchy ulceration in amebic colitis. A gram-positive diplococcus can be demonstrated throughout the wall of the intestine. It has been isolated from teeth, tonsils and other foci of infection.

Dr. J. A. Arnason presented two reels of motion pictures of scenes in Iceland taken at the national celebration last summer, attended by representatives from many countries, including the King of Denmark.

LEWIS COUNTY MEDICAL SOCIETY

Pres., H. L. Pettit; Secty., Rush Banks

Lewis County Medical Society held a meeting at Centralia January 12.

The following officers were elected for the ensuing year: President, H. B. Cravens, of Pe Ell; vice-president, L. G. Steck, Chehalis; secretary-treasurer, Rush Banks, Centralia.

The program consisted of an address by Dr. J. J. Markey of Seattle on surgical methods of treating pulmonary tuberculosis illustrated by a motion picture film.

PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the auditorium of the Rhodes Medical Arts Building, January 13, President D. M. Dayton in the chair.

This meeting combined a short clinical session with the dedication of the auditorium and library. Dr. Dayton announced that the minutes of the last meeting would be deferred because of the length of the program.

The following scientific program was given, each speaker being limited to ten minutes, and no discussion allowed:

Symposium on peptic ulcer:
Medical Aspects, Dr. J. R. Turner.
Surgical Aspects, Dr. M. T. Nelsen.
Roentgen-ray, Dr. C. R. Fishel.
Pathology, Dr. D. L. Martin.
Pyorrhea, J. J. McCarthy, D.D.S.

The application of Dr. Charles Firestone was read and referred to the trustees. The transfer of Dr. William Dietz from Spokane County Medical Society was read and accepted.

At this time Mr. Henry Rhodes and Mr. Roscoe Drumheller were brought to the platform and introduced. Dr. Joseph Griggs gave a masterly and timely introduction to Mr. Rhodes and Mr. Drumheller, conveying to them the thanks and appreciation of the medical profession for the wonderful facilities which they have provided for us. Dr. O. A. Simons, president of the Tacoma District Dental Society, also gave a talk of appreciation and thanks from the dental society. Mr. Rhodes and Mr. Drumheller spoke, expressing their gladness at having been able to add this building to Tacoma's skyline.

The meeting was followed by an entertainment and social time with refreshments, provided under the chairmanship of Dr. W. W. Mattson. The auditorium, foyer, library and anteroom were full and overflowing with members of the medical and dental societies.

SKAGIT COUNTY MEDICAL SOCIETY

Pres., W. L. Jackson; Secty., W. N. Hunt

Skagit County Medical Society held a meeting at Mount Vernon December 30 at Hotel President following a banquet. Dr. George H. Crabtree was elected president for the ensuing year. Dr. D. M. Prince was elected vice-president and Dr. A. G. Ostermann on the board of trustees, all being residents of Mount Vernon.

Dr. J. J. Markey of Seattle read a paper on the surgical treatment of pulmonary tuberculosis. The meeting was largely attended by physicians from different cities of the county.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., C. B. Ward; Secty., R. P. De Riemer

The annual meeting of Spokane County Medical Society was held at Spokane January 15, at 7:00 p.m. at the Spokane City Club. Dinner was served for members and their wives, of whom there were about 130 present.

The following officers were unanimously elected for 1931: President, W. W. Pennock; president-elect, J. G. Cunningham; secretary, D. G. Palmer; treasurer, F. E. Bertling; board of trustees, E. B. Nelson and F. B. Sprowl; board of censors, S. E. Lambert.

The annual report was given by President Ward.

Drs. Ralph E. Dalton and Lorenzo Walters were elected to membership.

PROGRAM

Turkey dinner and music, election of officers, travel film by Dr. Harbison, cards and games.

A special meeting of the society was held January 7 in the Paulsen Medical and Dental Building auditorium. Dr. J. A. Bargen of the Mayo Clinic spoke on "Management of Ulcerative Lesions of the Large Intestine."

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Secty., G. C. Daniels

Walla Walla Valley Medical Society held a meeting in Walla Walla January 8 at the Marcus Whitman Hotel. About forty physicians were present for the dinner and scientific program. Visitors were in attendance from Pasco, Dayton and Pendleton.

Dr. Robert C. Coffey of Portland presented a paper on "Surgical Measures of the Gallbladder and Kidneys," illustrated with lantern slides. Dr. M. F. Dwyer of Seattle gave an address on "Tumors of the Stomach," featuring methods of diagnosis and treatment.

LEWIS COUNTY MEDICAL SOCIETY held a special meeting at Chehalis January 5 and adopted a recommendation for an amendment to the insurance code placing all health insurance contracts and policies under control of the state insurance commission.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

TEXT-BOOK OF MEDICINE. Edited by Russel L. Cecil, A.B., M.D., Sc.D., Assistant Professor of Clinical Medicine in Cornell University, New York City, etc. And Associate Editor for Diseases of the Nervous System, Foster Kennedy, M.D., F.R.S.E., Professor of Neurology in Cornell University, etc. Second Edition, Revised and Entirely Reset. 1592 pp. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $9.00.

In this single volume one finds a text-book covering the whole range of medicine and written by about one hundred and thirty of the unquestioned leaders of medicine in the United States. Almost all the authors are professors of surgery, as Alfred W. Adson, Dean Lewis, John A. Hartwell and others. The chief objection to a book of this sort by many authors is the prabability of great diversity in style, quality and degree of thoroughness of the various monographs. This has been largely overcome by admirable editorial supervision, which has resulted in uniform brevity of the articles, compatible with their completeness.

In this second edition, four years after the first appearance of the book, we find new contributors of new subjects. A chapter on tularemia, by E. B. Francis; one on snake venom poisoning, by R. L. Ditmars; one on atelectasis of the lung, by C. P. Emerson; one on creeping eruption, by E. E. Tyzer; a monograph on Oroya fever, by H. S. Baldwin; a review of brucella abortus infections, by V. E. Heiser; an article on essential hypertension, by Malcolm Goodridge; a treatise on granulocytic angina, by Ordway and Gorham; and finally a new chapter on arthritis, by Cecil.

The work begins with consideration of a common cold, as most of our ailments begin at this season. The writer states that the etiology is still uncertain; that the value of vaccines is nil in prophylaxis. He finds as much difficulty in differentiating between a cold and influenza as we do, and thinks that warm clothing is better than "hardening" in prevention; and finally advises a rest and vacation after a severe cold, which appeals to all of us. This was the accepted treatment by all stock and bond brokers until the late financial unpleasantness. In the early diagnosis of bronchopneumonia the discovery of a patch of moist rales below the angle of one or both scapulae is quite characteristic, as noted by Dochez. The reviewer has frequently referred to it but it is now beginning to appear in text-books, first described by Christian. This is one of the few text-books on medicine, in which chronic cholecystitis comes into its own, as far as proper recognition and description adequate to its frequency and importance, is concerned.

Notwithstanding the necessity of conciseness in a work embracing the whole domain of medicine within the covers of one volume, one feels the individuality of the writer in many articles, as when Foster Kennedy concludes his discussion of brain tumors with the following true summation: "He who cares for patients suffering from brain tumor must bring to his task much thought and stout action. There is need, too, of formidable optimism, for the dice of the gods are loaded!"

One of the most interesting chapters is that by Cecil on arthritis, in which he has done so much original work. In the rheumatoid, chronic infectious or atrophic form, he finds short chain streptococci in seventy-five per cent of one hundred and fifty-four patients, in their blood or joints. This condition is due to three factors: a focus of infection, a streptococcus bacteremia and a susceptibility to streptococcal infection of the joints. In two hundred cases of infectious arthritis, the tonsils were infected in one hundred and twenty-two patients; the teeth alone, in twenty-one instances. Less frequent foci occurred in sinuses, gallbladder, prostate, colon and rarely in the cervix. The age of onset of arthritis in patients with infected tonsils was thirty, while in patients with infected teeth the disease began at the age of forty-two. In regard to treatment, Cecil emphasizes the necessity of early removal of focal infection to secure successful results, during the first year or so. When removal is delayed till after the second or third year, the results are usually most disappointing. Foreign protein therapy he has given up.

Vaccine therapy is applied with vaccines prepared from cultures of the patient's blood or from affected joints. If these are unobtainable a strain of streptococcus agglutinated by the patient's serum is selected for the vaccine. Cultures may be made from the joints. Persistence in the use of vaccines is essential, as very little benefit can be expected from them within the first two or three months. Physical therapy and massage are also of value. Hypertrophic arthritis Cecil regards as a degenerative process affecting the middle aged or elderly, and are little benefitted by removal of focal infections, except about the teeth. Vaccines and foreign protein therapy are useless but orthopedic means to secure proper posture, or rest by corsets and braces are more satisfactory. This work, taken as a whole, is undoubtedly the best single volume text-book on medicine today. WINSLOW.

PRACTICAL TREATISE ON DISEASES OF THE DIGESTIVE SYSTEM. By L. Winfield Kohn, M.D., F.A.C.P. Formerly Assistant in the Gastrointestinal Clinic, Johns Hopkins Hospital, Baltimore, etc. Illustrated with 542 Engravings. Cloth, 1073 pp. Two Volumes, $12.00. F. A. Davis Company, Philadelphia, 1930.

The first of these volumes deals with the anatomy and histology of the digestive system and consideration is given in a general way to the various methods of examination and to the many appliances used in the diagnosis and interpretation of findings as they relate to gastrointestinal disease. The diseases of the mouth cavity, tongue and salivary glands are covered in one chapter, diseases of the esophagus in another, and lastly, a chapter on diseases of the stomach concludes volume one. Volume two takes up the diseases of the remaining part of the digestive system. Fifty or more pages tell in a very interesting and readable manner the diseases of other organs and extraalimentary affections which produce gastrointestinal symptoms. Dietary and therapeutic considerations are dealt with in a very comprehensive manner. The closing chapter, surgery of the gastrointestinal tract, by Cope, reviews in twenty-five pages the very best operative treatment of such gastrointestinal diseases as are generally recognized as being at once or ultimately surgical cases.

This is by far the most readable and easily understood work on diseases of the digestive system the reviewer has read. Pages of statistics and experimental data are conspicuous by their absence, and it is a book which one reads with as much avidity as though it were a novel. Of special interest are the beautifully colored gastroscopic views, illustrating the picture of chronic gastritis, polypoid gastritis, carcinoma and ulcers of various kinds and locations within the stomach and esophagus. Numerous methods of treatment, some considered of questionable value in many quarters, are given in an unbiased way for what they may be worth. The author, apparently careful not to inject into these pages any personal bias, allows the reader to see all sides of all questions of disease and treatment. He speaks briefly of some methods which are freely used by so called "quacks," leaving their relative merits for the individual reader to decide. In the study of digestive disease, these two volumes take first place, after which one will be in a better position to undertake the investigation of more voluminous and statistical works. MANZER.

EMERGENCY SURGERY. By Hamilton Bailey, F.R.C.S. (Eng.). Late Surgeon, Dudley Road Hospital, Birmingham, Eng., etc. Volume I, Abdomen and Pelvis. With 324 Illustrations, some of which are in Colors. 380 pp. $8.00. William Wood & Co., New York, 1930.

Books written upon a foundation of personal experience can usually be read with profit by all. When the author has himself had charge of the patients, whose diseases make this foundation and their cases have been indexed and intelligently studied, their value is greatly increased. The author served for years under the master surgeons of England and their teachings have been the basis of his experience. The application of modern developments to that experience is apparent throughout this present volume. The work deals, perhaps, mostly with emergency surgery but there is so much that is sound, practical and conservative, touching many other phases of surgery, that its breadth and importance cannot be pictured from its title. The edition is well bound, printed on excellent paper and its pages average almost one illustration per page. These are well chosen and well done, definitely enhancing the value of the book. FORBES.

HISTORY OF HAITIAN MEDICINE. By Robert P. Parsons, Lieut.-Com., M.C., U.S.N. Foreward by Edward R. Stitt, Rear Admiral, M.C., U.S.N. With 21 Illustrations. 196 pp. $2.25. Paul B. Hoeber, Inc., New York. 1930.

The Haitian Republic has been much in the public eye in recent years. Aside from Liberia, it is the only sovereign government under negro control. Its early medical history consists entirely of superstition and voodooism. Under French rule there was a semblance of education in the medical fraternity which continued after freedom from French rule, in 1804. The next century presents a history of turbulence under various presidents which provided much opera bouffe material. Medical practice was in a most chaotic state when the United States Government took control in 1915. Then followed a transformation in all phases of the life of the Republic. For the first time the principles of sanitation were put into effect. The three scourages of malaria, yaws and intestinal parasites were brought under control and a comparative state of health was established throughout the country. The medical department of the University of Haiti graduates physicians, many of whom are men of ability. A predominating system of caste prevails, determined largely by color of skin, ranging from black to near white. The lighter shade always dominates the darker. The immaculately attired physician of the nineties, adorned with monocle and white gloves, has been replaced by industrious young men who have made a study of medical problems. What will occur when American occupation terminates is problematical. American efficiency may persist for a time but the native Haitian politics will probably take control with a result which none can foretell.

CHRONIC ARTHRITIS AND RHEUMATOID AFFECTIONS with RECOVERY RECORD. By Bernhard Langdon Wyatt, M.D., F.A.C.P., President and Director, The Desert Sanatorium and Institute of Research, Tucson, Arizona, etc. With the Collaboration of Louis I. Dublin, Ph.D., Statistician, The Metropolitan Life Insurance Co. 141 pp. $2.50. William Wood & Co., New York. 1930.

It is stated in this volume that statistics show that only four thousand deaths are charged annually to rheumatism in all forms or four per one hundred thousand. Two-thirds of these are due to acute rheumatic fever mostly in children. From a geographic point of view the high rate occurs in states with a relatively cold climate, thus in 1926 the highest rate being 3.4 for Maine down to .9 for Washington.

The author classifies arthritis into three general groups, mentioning a fourth or subclassification. The proliferative due to infection may be subdivided into true proliferative arthritis and rheumatoid conditions. The second large group is the degenerative or osteoarthritis which rarely if ever is due to infection. A third group, metabolic (gout), is due in great degree to an altered purine metabolism. Arthritis occurs only after the proper "soil" has been prepared in or about the joints by such things as exposure, minor injuries, mental excitement, worry, etc. As soon as the medical profession is alive to the possible causes of arthritis, routine health examinations and the work of the school doctors can do a great deal in correcting minor ailments and conditions which may eventually lead to this more serious disease. Early diagnosis should be the greatest help in the cure of arthritis.

As to treatment, diet should depend on the type of patient and the type of disease. As a rule cut down on sugars and starches, "provided that resistance may be fortified, nutrition improved and weight increased despite these limitations." Alkaline foods should predominate in the proliferative and acid foods in the degenerative type. Fluids should be taken at the rate of from six to fifteen glasses daily. The average American diet is too rich in calories and too poor in vitamins and therefore should be made as rich in vitamins as possible. To check the diet he believes one of the best indicators is a routine weekly determination of the weight of the patient.

Aside from colchicum, which is quite specific in the metabolic type, no drug has any specific value. Salicylates are of use in control of pain. Glandular extracts are used largely on an emperical basis in such conditions as menopausal complications, etc. Iodine, for its effect on the thyroid, is best used in small doses and alternated with arsenic. Arsenic is of particular value in anemias. Vaccines are of questionable value and should always be given as supplementary to other treatment in small doses and reactions avoided. Hydrotherapy and electrotherapy have some value and colonic lavage is recommended in cases suffering from intestinal toxemia. Ultraviolet is highly recommended for its stimulative effects. Infrared is also of some value if properly used. In general a warm climate is most desirable for chronic arthritis, though "climate alone should not take the place of a diligent search for and the removal of foci of infection, the adoption of proper dietary and other measures of demonstrated worth."

JEFFERY.

PATHOLOGY OF INTERNAL DISEASE. By William Boyd, M.D., M.R.C.P., Ed., Dipl. Psych., F.R.C.S. Professor of Pathology in the University of Manitoba; Pathologist to the Winnipeg General Hospital, Winnipeg, Canada. Illustrated with 298 Engravings. 888 pp., $10.00. Cloth. Lea & Febiger, Philadelphia, 1931.

Never has there been a pathology of internal diseases published that is as fascinatingly written as this, in spite of the great demand for such a book. The English is beautiful and its reading is easy because it is entertainingly written in spite of the difficulty of the subject. The more important diseases are treated thoroughly, the pathogenesis is beautifully done, many clinical relationships are given, the reasons for symptoms are well explained and the causes of physical signs are exceptionally well rendered in view of the fact that the writer is a pathologist rather than a clinician. In the main articles on infectious diseases the bacteriology is given in full except for technic. Such classics as the articles on rheumatism, subacute bacterial endocarditis and tuberculosis could be published as separate books and would find a ready market as monographs.

It is thought that the brevity with which the rarer diseases are treated detracts from the book as a reference work. However, the excellence of the main articles makes this a work that every internist should own. EPPLEN.

ABDOMINOPELVIC DIAGNOSIS in Women. By Arthur John Walscheid, M.D., Director of Obstetrical and Gynecological Department of Broad Street Hospital, New York, etc. With 397 Illustrations. One Color Plate. 1000 pp. $12.50. The C. V. Mosby Co., St. Louis, 1931.

The author has set out to write a clinical monograph on gynecological diagnosis by abdominal and pelvic examination with restricted use of laboratory procedures. As the title of the book suggests, very little attention is given to therapy. Operative procedures are likewise omitted. Fundamental knowledge on the part of the reader is assumed and the text is confined to practical points of physical examination as applied to gynecology. The subject matter is treated in a very general way and the style is rather difficult to read. The work will probably serve the purpose the author had in mind, but as a text or a source of reference it offers no improvement over older text-books.

DUNCAN.

HOW IT HAPPENED. By Adalbert G. Bettman, M. C., F.A.C.S., Portland, Ore. 110 pp. $1.00. F. A. Davis Company, Philadelphia, 1931.

This little volume features brief essays, a page each in length, written in blank verse form, describing one medical incident. They present experiences occurring in the practice of every physician. Some border on the satirical, some humorous, others pathetic. Reading this interesting volume will convince one that certain medical experiences are universal. Its perusal will afford a period of interest and amusement to any physician.

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Text-book of Gynecology. By Arthur H. Curtis, M.D., Professor and Head of the Department of Obstetrics and Gynecology, Northwestern University Medical School; Chief of the Gynecological Service, Passavant Memorial Hospital, Chicago. 380 pp. with 22 original illustrations. Cloth, $5.00. Philadelphia and London: W. B. Saunders Company, 1930.

This concise volume is written more as a record of personal experience than a text-book on gynecology. It is presented in a very condensed manner and all material considered nonessential by the author has been omitted. However, all subject matter which he believes vital to gynecology is very well presented. The association and close relation of the urinary tract to gynecology is stressed in a special chapter and the relation of radium and roentgen-ray therapy to this specialty is well presented. For a ready reference work for the student this volume is complete, but there are too many important omissions and abbreviations for a complete text-book on gynecology.

C. D. Shannon.

Diathermy Medical and Surgical in Oto-Laryngology. By Dan McKenzie, M.D., F.R.S.C.E. Consulting Surgeon, Central London Throat and Ear Hospital, etc. 184 pp. $4.00. The Macmillan Company, New York, 1930.

The author devotes space to describing the principles involved in diathermy and then discusses the application to oto-laryngology under medical diathermy. In general this agency offers relief for inflammatory conditions in which serous exudate into the tissues can be removed, with suppression of accompanying swelling and pain. Many conditions are cited in which this is applicable. Certain cases of deafness and tinnitus are benefitted, especially if they have been of short duration. Relief is rarely found in old chronic cases. Surgical diathermy is presented as to general conditions, then its application in nonmalignant disease and in the treatment of cancer. New growths in the mouth, pharynx, nose and ears are suitable in many instances to the application of these agencies. Desiccation, coagulation and fulguration may be utilized in selected cases. In attacking the tonsils and certain cancerous conditions the diathermy knife can also be employed. Different locations presenting these conditions are discussed with methods of treatment in each. One must not expect too much from this agency, but used often independently and again as supplementary to other methods it should prove of great assistance in treatment of various pathologic conditions in these parts of the body.

The Volume of the Blood and Plasma in Health and Disease. By Leonard G. Rowntree, M.D., and George E. Brown, M.D., Division of Medicine, The Mayo Clinic and The Mayo Foundation, Rochester, Minnesota, with the Technical Assistance of Grace M. Roth. 12mo, 219 pp. Illustrated. Philadelphia and London: W. B. Saunders Co., 1929. Cloth, $3.00 net.

This small monograph contains a summary of the work done by the authors on the volume of blood and the plasma in the normal individual and in disease. They use the simple harmless dye, Congo red, which undoubtedly will eventually be the procedure of choice, since it does not vary under different temperatures as in the case of the gas method. This is practically a new field and a very important one. It seems in time that its general adoption for differential diagnosis is a certainty. At present considerable work is being done in this domain and, therefore, this interesting treatise should be read by every medical man. The clinician, the surgeon and the laboratory worker will find it of special value. It is a preliminary brochure on the subject.

Drtina.

A Manual of Normal Physical Signs. By Wyndham B. Blanton, B. A., M.A., M.D., Assistant Professor in Medicine, Medical College of Virginia, Richmond. Second Edition. 246 pp. The C. V. Mosby Company. St. Louis. 1930.

This volume considers only normal physical signs with no discussion of pathology. There are chapters on sound, inspection, palpation, percussion, ausculation and constitutional signs. Chapters consider individual organs and the application to them of the principles previously discussed. Different methods of examination are presented, briefly and in numerical order, with a sufficient number of illustrations to emphasize the important features. The student can be especially benefited by its study.

The Medical Clinics of North America. (Issued serially, one number every other month.) Volume 14, No. 4. (Philadelphia Number, January, 1931). Octavo of 240 pp., with 47 illustrations. Per Clinic Year, July, 1930 to May, 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

This volume includes reports covering a great variety of conditions of disease. Three, pertaining to the intestinal tract, deal respectively with duodenitis, colon bacillus, ulcer and cancer of the stomach. Three writers make reports on circulatory disturbances, specifying heart block, types of extra heart sounds, right-sided carotid pulsation. Reports on endocrine disturbances including hypothyroidism, ports on endocrine disturbances include hypothyroidism, hypopituitary disease and hyperparathyroidism. These clinicians in Philadelphia. Many other important and instructive discussions are included.

Intradural Caudal Anesthesia in Urology. George H. Ewell, Madison, Wis. (*Journal A. M. A.*, Jan. 10, 1931), urges that it should be the aim of urologists to make cystoscopic examinations and all operative procedures through the cystoscope as painless as possible; better cooperation is obtained from both the patient and the general physician. Caudal anesthesia produces sufficient relaxation of the bladder for complete cystoscopic examination and treatment in all types of cases, the operative procedures are painless, and the work of the operator is greatly facilitated. It also provides a safe and reliable anesthesia for perineal surgery and operations on the external genitals in men, rectal surgery, and perineal plastic operations in women. The method of intradural caudal anesthesia is recommended because of its simplicity and reliability; by a single intradural injection complete sacral block anesthesia can be produced, whereas by the extradural technic the introduction of a needle and anesthetic solution into the sacral canal and into several or all of the eight sacral foramina would be necessary.

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BENIGN INFILTRATIONS IN THE CHILDHOOD TYPE OF EPITUBERCULOSIS*

REPORT OF TWO CASES, ONE WITH THE FOLLOWING SEQUENCE OF EVENTS: ERYTHEMA NODOSUM, PLEURISY WITH EFFUSION, BENIGN LOBAR INFILTRATION AND RESOLUTION, WITH A REVIEW OF THE LITERATURE

SAMUEL G. HENRICKE, M.D.
PORTLAND, ORE.

Infiltrations may occur in the lungs of tuberculous children, in which under reasonably hygienic conditions the prognosis is excellent. This has been repeatedly recorded in the literature and efforts have been made to coin a properly descriptive name for them and various theories have been advanced in an effort to arrive at a true concept of their pathogenesis. Much confusion has resulted and an attempt will herein be made to present in textbook fashion the salient points in the literature to date. The importance of a proper understanding of these benign infiltrations lies in their prognosis and treatment, due to the fact that, if improperly advised, those responsible for the welfare of the child may be put to much unnecessary economic loss and anxiety and that the patient might be forced to recover in spite of, rather than because of, misdirected therapy.

SYNONYMS

Recurring hilus tuberculosis (Wessler and Bass), epituberculosis (Eliasberg and Neuland), paratuberculosis (Engel), chronic tuberculous hilus pneumonia (Greenberg), perifocal infiltration (Birk and Hager), collateral inflammation (Tendeloo), perifocal inflammation (Ranke), splenopneumonie (Grancher), gelatinous infiltration (Frankel), and pulmonary tuberculosis of the epituberculous type (Weech and Chu).

HISTORY

In 1883, Grancher,[1] under the name "splenopneumonie," described a condition which in all likelihood should be included in the group of benign infiltrations under consideration. Bourdel,[2] three years later, in a book "De la Splenopneumonie," discussed the affection. The earliest observations appearing in the German literature are those of Frankle (1895).[3] He expressed the opinion that the exudations which he described were toxic reactions on the part of the lung tissue and stated that they might disappear, leaving little evidence of their previous existence. Sulka (1910-12-13),[4] Eisler (1912),[5] and Rach (1913-14)[6] reported roentgenologic observations on the subject. Sulka reported thirty-eight instances and stated that the infiltrations were probably due to involvement of the pulmonary tissue through extension from caseated lymph nodes at the hilum. Eisler considered these roentgen shadows, which in these first reported instances were usually found on the right in relation to the interlobar fissure, a result of a pleuritis produced by a primary focus in this area.

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* From the Pediatric Department of the University of Oregon Medical School, Portland, Ore.
* Read at the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Spt. 17-19, 1930.

1. Grancher: Proceeding Societe Medicale des Hopitaux, 8, 13, 1883.
2. Bourdel: De la Splenopneumonie, Paris, 1886.
3. Frankel, A.: Klinische und anatomische Mittheillungen uber indurative Lungenentzundung, Deutsche. med. Wchnschr., 1895, x.
4. Sulka, E.: Ueber Roentgenbefunde bei Tuberkulosen Kindern mit Expiratorischem Keuchen, Wien. klin. Wchschr., xxxiii, 1910; Die Hilustuberkulose des Kindes im Roentgenbilds, Wien, klin. Wchschr., vii, p. 259, Feb., 1912; Ein Welterer Beitrag zur Hilustuberkulose des Kindes in Roentgenbilde, Wien. klin. Wchschr., vii, p. 254, Feb., 1913.
5. Eisler, F.: Die Interlobare pleuritische Schwarte der Kindlichen Lunge im Roentgenbilde, Munchen. med. Wchschr., xxxv, 1912.
6. Rach, E.: Beitrage zur Roentgendiagnostik der Lungen tuberkulose im Kindesalter, Ztschr. f. Kindern, viii, 312, 1913; Radiologisch erkennbare anatomische Typen der Kindlichen Lungentuberkulose, Munchen. med. Wchschr., viii, 1914; Zur Klinik der Bronchialdruesentuberkulose im Kindesalter, Beitr. z. Klin. d. Tuberk., xxxii, 1914.

Hutinel[7] was the first French author to note the frequency of associationship of splenopneumonie with hilus tuberculosis. Wessler and Bass (1916)[8] coined the name "recurring hilus tuberculosis." Eliasberg and Neuland (1920-21)[9] published their classic papers, suggesting the name "epituberculosis," which has met with quite general acceptance during the past decade, distinguishing the condition from a gelatinous or caseous pneumonia. Engel (1921)[10] considered "paratuberculosis" the appelation which should be used. Grävinghoff (1921)[11] further discussed the differential diagnosis from the standpoint of gelatinous pneumonia. Greenberg (1921)[12] referred to the condition as a "chronic tuberculous hilus pneumonia." Langer (1922)[13] reports a recurrence, four years after the disappearance of a large infiltration, brought about by the subcutaneous injection of 0.1 mg. of tuberculin and concludes that these infiltrations should be looked upon as true tuberculous processes. Mourek (1922)[14] discussed the type of case described by Eliasberg and Neuland and concludes that they may best be considered as scrofulosis. Epstein (1922)[15] reports autopsy observations which have not met with general acceptance. Sheviki (1925)[16] reports two instances in adults. Henius (1926)[17] in discussing two cases in young adults calls attention to the need for differentiating benign infiltrations from caseous processes.

Neumann (1926)[18] explains "epituberculosis" on the basis of the exudative diathesis. Gerstenberger and Burhans (1927)[19] describe the progress of seven tuberculous infants, who had extensive pulmonary infiltrations, to recovery. Three were reported as giving roentgenologic evidence of cavitation. While not reported as epituberculosis, it is difficult justly otherwise to classify them. Koelzer (1927-28)[20] describes an instance of four recurrences over a period of two and three-fourths years and mentions a coexistent true pulmonary tuberculosis. McPhedran (1927)[21] discusses the roentgenologic aspect of these infiltrations. Roelofs (1928)[22] describes an instance presenting a pneumonia-like onset, with absorption in a few months. Fernbach (1928)[23] discusses the subject in general, placing stress on the aspect of allergy.

Sonnenfeld (1928)[24] calls attention to the fact that the condition may also occur among young adults fifteen to thirty-five years of age. Wolff (1928)[25] presented two cases. Birk and Hager (1928)[26] reported their observations on fifty cases of perifocal infiltrations, classifying them in three groups, namely, (1) the epituberculosis of Eliasberg and Neuland, (2) perifocal infiltrations, and (3) perihilar infiltrations. Schesinger (1929)[26] reviews the subject and reports having seen two cases. Wood (1929)[27] calls it a "clinical curiosity" and states that he has seen only one instance. Bigler (1929)[28] briefly discusses the condition from a roentgenologic standpoint. Soto and Ontiveros

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[7] K. Hutinel: Les reactions broncho-pulmonaires dans les adenopathies mediastines, Gas. des. hop., 84:76, 1911.

[8] Wessler, H. and Bass, M. H.: Recurrent Hilus Infiltration, Am. J. Dis. Child., 11:198, 1916.

[9] Eliasberg, H. and Neuland, W.: Die epituberkulose Infiltration der Lunge bei tuberkulosen Sauglingen und Kindern, Jahrb. f. Kinderh, 93:88, 1920; Zur Klinik der epituberkulosen und gelationosen Infiltration der kindlichen Lunge., Jahrb. f. Kinderh., 94:102, 1921.

[10] Engel, S.: Uber paratuberkulose Lungenerkrankungen, Berl. klin. Wchschr., 58:877, 1921.

[11] Gravinghoff: Zur Kenntnis der "epituberkuolsen infiltration," Monatschr. f. Kinderh, 21:447-458, 1921.

[12] Greenberg, D.: Chronic Tuberculous Hilus Pneumonia in Children, Am. J. Dis. Child., 21: 65-77, 1921.

[13] Langer, H.: Die spezifitat ruckbildungsfahiger Lungeninfiltrat bei kindlicher Tuberkulose (sog. epituberkulose infiltration), Ztschr. f. Kinderh., 33-34:142-149, 1922-1923.

[14] Moureck: Cas. Lek. cesk., Prague, 61:1124, Nov. 25, 1922. Abstract from J. A. M. A., 80:443, Feb. 10, 1923.

[15] Epstein, B.: Zur Kenntnis der epituberkulosen Infiltration der kindlichen Lunge, Jahrb. f. Kinderh, 99:59, 1922.

[16] Schviki, M.: Two Cases of Epituberculous Infiltration of the Lungs of Adults, Beitr. z. Klin. d. Tuberk., 61:629-635, 1925.

[17] Henius, C.: Reversible Exudative Tuberkulose Erkrankungsprozesse in den Lungen, Klin. Wchschr., Jg. 5, Nr. 16, z. 712.

[18] Neumann, M.: Zur frage der "epituberkulose" im Kindesalter, Die Tuberkulose, vi, 185, 1926. From the abstract section, Am. Rev. Tuberc., 15:20, 1927.

[19] Gerstenberger, H. J. and Burhans, C. W.: Treatment of Extensive Pulmonary Tuberculosis with Ultraviolet Rays, Am. J. Dis. Child., 33:54-77, 1927.

[20] Koelzer, W.: Beitrag zur Klinik der epituberkulosen Infiltration, Jahrb. f. Kinderh., 115:194, 1927; Vier Roentgenbilder von rezidivierender epituberkuloser Infiltration, Jahrb. f. Kinderh., 120:228-231, 1928.

[21] McPhedran, F. M.: The X-ray Diagnosis of Pulmonary Tuberculosis in Children, Am. Rev. Tuberc., 16:420, 1927.

[22] Roelofs, E.: Een geval von epituberculeuse infiltratie, Nederl. tijdschr. v. Geneesk., Jg. 72, Bd. 1, No. 20, 1928. From the abstract section, Ztschr. f. Tuberk., 52:86, 1928.

[23] Fernbach, H.: Die epituberkulose Infiltration, Beitr. z. Klin. d. Tuberk., 69:514, 1928. From abstract section, Ztschr. f. Tuberk., 52:414, 1929.

[24] Sonnenfeld, T.: Frage der sogenannten epituberkulosen Infiltration bei Erwachsenen, Beitr. z. Klin. f. Tuberk., 69:209, 1928. From the abstract section, Ztschr. f. Tuberk., 52:209, 1928.

[25] Wolff, E.: Perifocal Infiltration in Juvenile Tuberculosis, Calif. and West. Med., 20:170-173, Sept., 1928.

[26] Birk, Prof. and Hager: Die Klinik der perifokalen (epituberkulosen) Infiltrierung bei Kindern, Munchen med. Wchschr., 75:1991-1996, 1928 and 75:2057-2061, 1928.

[26] Schlesinger, B.: The Diagnosis of Intrathoracic Tuberculosis in Children, Tubercle, 11:1-8, Oct., 1929.

[27] Wood, W. B.: The Diagnosis of Pulmonary Tuberculosis in Children, Tubercle, 11:8-13, Oct., 1929.

[28] Bigler, J. A.: Interpretation of Roentgenograms of the Chests of Children Based on Observations at Necropsy, Am. J. Dis. Child., 38:1166-1182, Dec., 1929.

(1929)[29] classify the principal forms of pulmonary infiltrations as splenopneumonia, epituberculosis and some small perifocal infiltrations. Rothman (1930)[30] cites a case in which, after the persistence of an infiltration for nine months, a miliary tuberculosis developed, the infiltration disappearing almost entirely before death. Weech and Chu (1930)[31] discuss the subject from the standpoint of pathogenesis in a most excellent paper.

Goldberg and Gasul (1930)[32] reported observations on ten typical cases of epituberculosis, extending over a period of more than two years. In one case, during resorption, repeating a tuberculin test (dermatubin) produced a marked focal, local and general reaction, with complete consolidation of the entire right lung.

CLASSIFICATION

It is with reluctance that the author suggests an addition to the already confusing group of names and classifications mentioned in the literature to date. It is only with an eye to the adoption of a properly descriptive name which will embrace all the various forms of infiltrations, of an apparently similar character, and to their arrangement in a classification which will be all-inclusive, that these suggestions are offered to the profession for its consideration. The name which I propose is one which will have as definite a meaning to the general practitioner of medicine as to one primarily interested in tuberculosis or pediatrics, hence, *benign infiltrations in the childhood type of epituberculosis.* That they are benign is self-evident. Nor is the statement open to question that they invariably occur as a complication of what the American Sanitorium Association has chosen to call the "childhood type of tuberculosis."[33]

A combination of the classifications suggested by Birk and Hager and by Soto and Ontiveros appears to be satisfactory:

1. Massive infiltrations (splenopneumonie).
2. Lobar infiltrations (epituberculosis of Eliasberg and Neuland).
3. Perihilar infiltrations.
4. Perifocal infiltrations.

In the above classification it may seem at first glance that the various types of infiltrations differed from one another only in size and location. I shall briefly discuss the various theories which have been offered in an effort to explain their pathogenesis in an effort to justify my opinion that each one of these four types of infiltration must in the present state of our knowledge be explained separately, inasmuch as no one theory satisfactorily elucidates the occurrence of all.

PATHOGENESIS

What do we know of the pathologic anatomy of these benign infiltrations? Little autopsy material has been available for study, and what has been was altered by the actual cause of death or was obtained after complete resolution had taken place. Eliasberg and Neuland, Engle, Epstein, Grävinghoff and Rothman have reported autopsy findings which do little to clarify our understanding of this interesting condition. Weech and Chu call attention to the fact that, if a case comes to autopsy during the height of the infiltration, we do not know what the tendency to resolution would have been, and if resolution has occurred, we know nothing of the previous condition.

Upon the premise that the exciting cause for the occurrence of these infiltrations is a tuberculous infection, all authors are agreed. Almost without exception a positive cutaneous tuberculin reaction is elicited. Birk and Hager state that, while theoretically a positive cutaneous reaction to tuberculin is the conditio sine qua non, cases which they have observed occasionally in the presence of a history of close contact, typical onset and progress, classic roentgen findings, with eventual complete resolution, have persistently given negative reactions. They cite two examples. In a third instance (case No. 27 of their series), after repeated negative cutaneous reactions, a markedly positive Pirquet reaction was produced on the fifty-second day of the illness. A few days later, a severe grippe infection occurred and during this time tubercle bacilli were recovered from the stomach contents of this year and a half old child. After five months a very extensive infiltration, as well as an interlobar pleuritis, had completely disappeared and the child made an uneventful recovery.

These exceptions to the rule of positive cutaneous tuberculin reactions cause the authors to suggest that there may at times be a difference in the allergic status of the skin as compared to the lung tissue. Further, they cannot see why, as they put it, what is proper for tuberculosis might not reasonably be expected of other infections. They mention the observations of von Ruscher[34] who described similar roentgen shadows in asthmatic children. Peshkin[35] has since published similar observations in this country. Birk and Hager also caution against dependence upon the Pirquet test, advocating repeated intradermal testings. Further support to the concept of a tuberculous anlage for these infiltrations can be drawn from the frequency with which other evidences of tuberculous infection are associated with them, namely, phlyctenular conjunctivitis, tuberculous lymphadenitis, tuberculids, and, as illustrated in case 1, in keeping with the opinion of European observers, erythema nodosum. The residual changes roentgenologically found in the hilus after the disappearance of an infiltration are of a type usually interpreted as tuberculous.

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[29] Laffon y Soto and Ontiveros, J.: Paratuberculous Pulmonary Infiltrations in Children, Arch. Espan. d. Pediat., Madrid, Nov., 1929. From abstract, Arch. Pediat., p. 481, Feb., 1930.

[30] Rothman, P. E.: Epituberculosis, Arch. Pediat., 47:194-196, Mar., 1930.

[31] Weech, A. A. and Chu, F. T.: Pulmonary Tuberculosis of the Epituberculous Type, Nat. M. J. China, 16:1-27, Feb., 1930.

[32] Goldberg, B. and Gasul, B. M.: Epituberculosis, A Study of Ten Cases for a Period of Over Two Years, Am. J. M. Sc., 180:824-832, Dec., 1930.

[33] Name adopted by the American Sanitorium Association, Childhood Type of Tuberculosis, Chadwick and McPhedran, Nat. Tuberc. Assn., New York City, 1930.

The first question which must be solved before an understanding of the pathogenesis can be reached is whether or not these benign infiltrations are "specific." Eliasberg and Neuland used the term "nonspecific" in discussing the type of infiltration described by them. By this they hoped to distinguish a process resulting from the action of tuberculotoxins from other forms of pulmonary pathology caused by the direct action of the tubercle bacillus. It would be a step toward simplification if this confusing term, nonspecific, were discarded, at least until the pathogenesis of the condition is established on more than a theoretical basis.

Allergy. Most authors are quite willing to accept the hypothesis of allergic reaction of lung tissue to tuberculotoxin during a phase of increased allergic sensitization as the pathogenic basis for the occurrence of these infiltrations. After disappearance the roentgen examination almost always reveals an apparently complete return to normal, with the exception possibly of the focus from which the tuberculotoxins emanated. Birk and Hager state that at any point in the development of the primary or secondary stage of the childhood type of tuberculosis, if the proper phase of allergy prevail, infiltrations may occur. This produces manifold possibilities as to the location and size of these infiltrations. Primary focus, lymph passages to the hilus glands draining the affected area, the hilus glands themselves, and any of the subsequent possibilities of extension of the process from these areas to contiguous structures might become the exciting cause of an infiltration. If the entire primary complex of Ranke were producing tuberculotoxins at the time the allergic state of the individual was favorable, then, these authors feel, the epituberculosis of Eliasberg and Neuland results. Sonnenfeld, Schlack,[36] Klare[37] and Wolf feel that the occurrence of infiltrations is a secondary stage phenomenon.

A discussion of allergy in its relationship to our subject would not be complete without mention of the case reported by Langer. Four years after the disappearance of a rather large infiltration, the subcutaneous injection of 0.1 mg. of tuberculin precipitated a severe local and general reaction with a recurrence of the infiltration in the same pulmonary area previously affected. There can be little question of the influence of allergy in this instance. Goldberg and Gasul have had a somewhat similar experience. In case 1, of this report, the subcutaneous injection of 0.1 mg. of tuberculin, with the severe local and general reaction which followed, may have been a definite factor in the production of a lobar infiltration which was quite typical of the variety which Eliasberg and Neuland called epituberculosis. Figure 5 taken on the same day an hour following the administration of the tuberculin, does, however, show what might be interpreted as a beginning lobar infiltration, extending from the hilus just above the interlobar fissure.

After a period of quiescence, any renewal of activity in the primary complex with a renewed output of tuberculotoxins may result in a Pirquetic reaction in the contiguous sensitized lung tissue. The extent of the resulting infiltration depends upon the amount of tuberculotoxin produced, the phase of general and local allergy, and at times upon the possibility of actual bronchial dissemination of tubercle bacilli through erosion of a caseated hilus node. Birk and Hager may be correct in their assumption that at times a marked pulmonary sensitization may occur with a low skin sensitivity. This would explain the negative and weakly positive cutaneous reactions described by themselves and Weech and Chu, in the face of an existent infiltration.

Weech and Chu, while admitting that allergy plays an important role in the pathogenesis of these infiltrations, which they prefer to call "pulmonary tuberculosis of the epituberculous type," suggest an explanation for their occurrence based on the work of Rich and McCordock,[38] Krauss,[39] and Austrian and Willis.[40] They feel that a hilus gland rupturing into a bronchus and thereby disseminating a limited number of organisms throughout the ramifications of that bronchial tree, could produce the picture of one of these benign infiltrations. They state, quoting Rich and Murdock, that, if the number of organisms be small enough and the resistence of the individual great enough, the process will not go on to caseation and cavity formation but rather run the mild course characteristic of these benign infiltrations, with complete recovery roentgenologically.

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[34] von Ruscher: Munchen. med. Wchschr., 1921. Quoted by Birk and Hager.

[35] Peshkin, M. M.: Asthma in Children III, Am. J. Dis. Child., 33:880-894, 1927.

[36] Schlack, H.: Die Frage der sog. epituberkulosen Infiltration der Lungen, Beitr. z. Klin. d. Tuberk., 63: 275, 1926.

[37] Klare, K.: Die roentgenologische Diagnose und Differentialdiagnose der kindlichen intrathorakalen Tuberkulose, Wurzb. Abhandl., 22:1.

They favor this explanation because it explains to their satisfaction the allergic discrepancy existing, when a negative cutaneous reaction is found in the presence of an infiltration. Further, they feel that this explanation covers those occasional instances, in which tubercle bacilli have been found in the sputum of those suffering from benign infiltrations. Personally, it is not difficult to understand how at times, when activity in some part of the primary complex has precipitated an infiltration, that through this activity, before it is again quiescent, bacilli should find their way into the bronchi.

Tubercle bacilli found in the sputum during the course of an infiltration are a part, not of the clinical picture of the benign infiltration, but rather a result of the activity in the originally infected area, which was the primary cause of the infiltration. If there be any rational basis for the offering of Weech and Chu, then the presence of organisms in the sputum should be the rule, rather than the exception, and the same may be said as to the lack of evidence of true tissue destruction, roentgenographically, after disappearance of these infiltrations. That occasionally in childhood a tuberculous bronchopneumonia might, shortly after its onset, come under the control of the patient's defense mechanism, resulting in a picture similar to that of these benign infiltrations, I have no reason to question. The infiltration incidental to such a situation would, too, disappear and then the reasoning of Weech and Chu would be quite in accordance.

Atelectasis, involving an entire lung, a lobe, part of a lobe or parts of two lobes unilaterally or bilaterally may result, it has been suggested by Stoloff[41] and others, from the presence of a primary complex. Pressure of the enlarged hilus glands, if producing complete obstruction, would cause atlectasis, the extent of which would be governed by the size of the air passage obstructed. Exudations within the lumen of the bronchus or its subdivision at the point of obstruction may enhance the process of occlusion. The roentgen findings would resemble those produced by benign infiltrations and the same may be said for the physical findings.

Stoloff, in discussing a case of atelectasis in its most extensive form, namely massive collapse which complicated a fresh primary complex, could identify, in addition to the uniform shadow of atelectasis, evidence of what is mentioned in my classification as a perihilar infiltration (see case 2). He feels that this perihilar infiltration is produced by the enlarged nodes, perifocal infiltration (according to the allergic theory) and interlobar thickening. He states that pneumonia, Hodgkin's disease, leukemias and tumors might produce similar hilus shadows but Weech and Chu call attention to the fact that infiltrations do not occur secondarily to such hilus disease of nontuberculous origin.

Another objection which they raise to the theory that atelectasis plays a role in the production of these benign infiltrations is that an enlargement of an acute tuberculous type in a hilus gland would in most instances be followed by rupture into a bronchus with dissemination of tubercle bacilli. This objection is itself the basis of the theory of bronchial dissemination of tubercle bacilli into an allergic lung field which these authors favor. The theory of atelectatic collapse is to them unsatisfactory, further, because it has been reported that occasionally loud bronchial breathing has been heard over what were apparently benign infiltrations. This is inconsistent, they say, with the expectancy in atelectasis. Distant bronchial breathing is, however, the rule and the reverse, indeed, a rarity. Weech and Chu cannot see in atelectasis an explanation for the resolution of benign infiltrations from the periphery toward the hilum. Ghon found in performing the autopsy on Epstein's case evidence of atelectasis in addition to the caseous primary focus surrounded by many small tubercles.

Koch's story of acute obstruction of the regional lymph nodes[42] is mentioned for the sake of completeness. The absence of rales and the rapidity with which collateral lymph channels and regenerated lymphatics would have removed the edematous transudate is not in keeping with the prolonged course of some of these infiltrations.

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[38] Rich, A. R. and McCordock, H. A.: An Enquiry Concerning Allergy, Immunity, and Other Factors of Importance in the Pathogenesis of Human Tuberculosis, Bull. Johns Hopkins Hosp., 44:273, 1929.

[39] Krauss, A. K.: The Anatomical Structure of Tubercle from Histogenesis to Cavity, Am. Rev. Tuberc., 15:137, 1927.

[40] Austrian, C. R. and Willis, H. S.: The Pulmonary Effects of Intratracheal Injections of Tubercle Bacilli and Blood in Rabbits. An Experimental Study of the Factors Responsible for Roentgenographic Changes Following Haemoptysis in Pulmonary Tuberculosis. Am. Rev. Tuberc., 14:306, 1926.

[41] Stoloff, E. G.: Massive Atelectasis of the Lung, Complicating a Fresh Primary Tuberculous Complex, Am. J. Dis. Child., 35:239-249, 1928.

[42] Koch, J.: Pathologische Anatomie der kindlichen Tuberculose, Monatschr. f. Kinderh., 29:303, 1924-25.

Gerstenberger and Burhans ask themselves whether massive infiltrations, even if limited to one lobe, are not evidences "of a general immunologic attack of the body against the tubercle bacillus, rather than the result of local irritation of the tissue by the tubercle bacillus."

From the preceding discussion of the pathogenesis of benign perituberculous infiltrations it is evident that while, if we include in our classification only those infiltrations in which allergy plays the prime role, we might find numerous cases which could illustrate our four subdivisions. Nevertheless, our knowledge of the subject is still too imperfect and our diagnostic methods too crude for us to state definitely that in this case or that atelectasis, bronchial dissemination of tubercle bacilli, or even edema due to acute obstruction of regional lymphatics, do not play an important, if not the major role.

CLINICAL CHARACTERISTICS

Discovery of the existence of these infiltrations by the physician may come about in various ways. (1) They may be discovered quite accidentally in the routine examination in clinics devoted to the observations of children who have been contacts with open cases of pulmonary tuberculosis. (2) Tuberculous stigmata, such as phlyctenular conjunctivitis, tuberculids, tuberculosis of the bones or lymphatic glands or erythema nodosum, may lead to investigations which may bring them to light. (3) Unfavorable convalescence from an attack of measles, whooping-cough, influenza, scarlet fever, chicken-pox, mumps, acute lymphadenitis and upper respiratory infections, in short, any infection which might spur a tuberculous focus to renewed activity, could lead to the making of a roentgen examination with their elicitation. (4) Symptoms referable to the respiratory tract, unexplainable in any other way, or a persistent malnutrition, anorexia or pallor might invoke the aid of roentgenology.

Age incidence. This condition is essentially a disease of the preschool child. Cases have been reported in which infiltrations were discovered in infancy, one as young as four months. Case 2 was a child eight years of age. Neumann and v. Ruscher have also noted the condition in eight year old children. In Birk and Hager's series of fifty cases, while most of the children were under five years of age, many were older, several being twelve years old. Sonnenfeld calls attention to the fact that the condition may occur in young adults, fifteen to thirty-five years of age. Sheviki reports two incidences in adults, and Henius does also.

Onset. It is often difficult to place chronologically the onset of an infiltration because of the mildness of the constitutional disturbance at that time. If the process is purely a manifestation of allergy, then no more general disorder should be expected than would be found during an attack of urticaria or bronchial asthma. What symptoms there are will, I believe, depend upon the degree of activity and location of the offending active focus. Cough and temperature have been prominently mentioned in the literature, in all degrees, from very slight to pneumonia-like severity. These symptoms subside after a few days as a rule, but at times persist for a week or two. In case 1, if the infiltration developed independently of the reaction to the intracutaneous tuberculin test, then we are reasonably safe in feeling that its development was unattended by any abnormal manifestation. In case 2, seen first on March 1, 1930, a history of cough and moderate lassitude of about three months duration was elicited. The onset could be chronologically placed as of the beginning of the cough, but no recollection of any other evidence of constitutional or local disturbance could be brought to mind.

Course. All authors are agreed as to the benign course of these infiltrations. The expectancy is that the patients will, after any symptoms at the onset have subsided, be temperature-free and symptom-free. Dyspnea is absent even with extensive infiltrations. Many children gain in weight. The duration varies to a marked degree. There is no way in which one can prognosticate the resolution of an infiltration. It may be a few weeks or more than a year. The process is unaffected apparently by intercurrent attacks of the acute infectious diseases. The menace to the offending focus is omnipresent, however. At times there may be a recurrence of the infiltration, either in the same or in some other area. In a case described by Koelzer four distinct infiltrations appeared and disappeared over a period of two and three-quarters years. An absence of sputum is the rule, but when obtainable, either through expectoration or from the stomach contents, it is almost always negative for tubercle bacilli. As I have mentioned before, it is not surprising that with activity in a tuberculous focus in the pulmonary or hilus area, occasionally tubercle bacilli should be found in the sputum.

Physical findings. The physical findings are not in proportion to the extent of the process revealed roentgenologically. Dullness on percussion, suppressed or distant breath sounds, usually of tubular type, indicate an area of pathology, as a rule much smaller than that revealed by the roentgenogram. Indeed, the breath sounds may have only a distant normal quality. Rales are rarely noted, and, if they are, the hilus region and the edge of the area of consolidation are the locations in which they are most apt to be found. Birk and Hager state that they may even be found on the roentgenologically negative side. The presence of rales is usually of short duration.

Perifocal infiltrations, such as that revealed in the left pulmonic area (case 2), produce no abnormal physical findings; at least, none comparable to an area of bronchopneumonia of similar size.

In perihilar infiltrations the physical signs are very inclusive. The lack of value of D'Espine's sign and interscapular dullness are well known and may be discarded. Wallgreen's spinotracheal breathing, Petruschky's spinalgia, and Koranyi's percussion of the spine have been found to be of little value in this type of infiltration.

Roentgen findings. In the lobar type of infiltration, described by Eliasberg and Neuland as epituberculosis, the roentgenogram reveals the process in the upper lobes in two-thirds of the cases. Usually the right upper lobe is involved. At times the infiltration seems to be confined to one lobe, but on other occasions it may appear to extend over the borders of one into the adjoining lobe. Whether involvement of the adjacent lobe actually takes place, it is difficult to state definitely. Improvement of roentgenographic technic as applied to these conditions may in time prove whether this encroachment is real or only apparent. In the beginning, these infiltrations produce a uniform shadow, while later, especially prior to resolution, the opacity becomes mottled, resembling a true pulmonary tuberculosis. This is clearly shown in a comparison of figures 6 and 9, in case 1. It will be noted that in figure 9 resolution is beginning in the periphery, another characteristic of the condition, as previously mentioned.

In the perihilar infiltrations we are dealing with involvements of groups of glands in the secondary stage of the childhood type of tuberculosis. The entire process is not evident to us, roentgenologically part of it being obscured by the heart and blood vessel shadows. These perihilar infiltrations are usually of three types:

1. The triangular type, first described by Sulka, having its base at the hilum and extending to the periphery in relation to the interlobar fissure. Figure 12 (case 2) shows such an infiltration on the right.
2. The hemispherical type suggests large round perifocal infiltrations, half of which is covered by the opacity created by the normal hilum.
3. The striped or banded type which appears as striations, extending from the region of the paratracheal glands to or almost to the diaphragm. The inner border of these infiltrations disappears at the heart shadow. When they appear on the left side, they are for the most part obscured by the cardiac shadow.

The perifocal infiltrations appear as round or oval shadows, varying in size from that of a hazelnut to that of a small apple. They may be single or multiple, unilateral or bilateral. The related hilus region is practically always involved as well. At times the march of events in the lung may be reconstructed from the roentgenographic findings, through the detection of infiltration about the primary focus with striations running to the involved hilus glands.

Tuberculin reaction. Theoretically a positive cutaneous reaction to tuberculin is the conditio sine qua non. That there have been exceptions has already been mentioned and discussed, when pathogenesis was considered. The Mantoux test is eminently more satisfactory than the Pirquet. Langer, and Goldberg and Gasul noted recurrence or extension of infiltrations, following markedly positive tuberculin reactions.

Laboratory findings. The sedimentation rate is increased in only extensive fresh infiltrations. It soon returns to normal, after activity in the tuberculous focus has subsided. It may be of value in differentiating early infiltrations from those of long standing and, if the rate is persistently increased, may be of assistance in differentiating benign infiltrations from slow progressing caseous pneumonias.

Birk and Hager, in their series of fifty cases, have found the Schilling index to be of great value. Early they found an increase in the neutrophiles with a shift to the left, a low eosinophile count, with an increase in Turk's irritation forms. Later they noted a shift to the right with an increase in the lymphocytes. Eventually they found a return of the differential count to normal, with a high eosinophile and monocyte count.

Intelligently interpreted, the modified Arneth and Schilling counts will be of some assistance from a prognostic standpoint. They should not be made soon after cutaneous tuberculin testing is done because of the possible influence of a positive reaction on the blood picture.

Goldberg and Gasul found in their series of ten cases that the ordinary differential count was of no assistance in diagnosing the affection, that the complement fixation test for tuberculosis was of absolutely no value and that repeated search for tubercle bacilli in the sputum yielded negative results in the face of uniformly definitely positive tuberculous reactions.

Diagnosis. In children known to be tuberculous, though apparently not suffering from a serious lung affection, in whom an infiltration is discovered or develops while under observation, with little or no variance from the child's normal status of health, the diagnosis of benign infiltration may reasonably be made. If the onset be associated with fever and cough which disappear in a few days or weeks, the child returning to its previous condition of health, despite the persistence of the consolidation, the same diagnosis should be called to mind. If the diagnosis cannot be made shortly after the onset, the mildness of its course from the standpoint of constitutional disturbance, and its comparatively long duration, would be suggestive. The end-result, complete disappearance of the infiltration, should make the diagnosis reasonably certain.

Differential diagnosis. Unresolved pneumonia would in all likelihood be the first thought, should a benign infiltration be discovered quite accidentally. This could be dismissed for many reasons. There would be no history of a previous illness which could be construed to have been a lobar pneumonia. No rales would be found in most instances. In most cases the upper lobes would be involved, while pneumonia is more apt to occur in the lower lobes. Benign infiltrations do not have a tendency to result in fibrosis. Furthermore, unresolved pneumonia is extremely rare.

Primary tuberculous bronchpneumonia (caseous pneumonia) may be eliminated when the onset is stormy, resembling a lobar pneumonia. When the onset is more insiduous and the course at first more or less benign, the differentiation is more difficult. Time will make the diagnosis evident for, it has been said, the tuberculous bronchopneumonias usually go on to caseation within three months. In the latter condition the finding of tubercle bacilli is the rule, while in benign perituberculous infiltrations the reverse is true.

Two nontuberculous conditions are worthy of mention. First, from the peribronchial pulmonary infiltrations of Heiman and Cohen the differentiation should be easy. These infiltrations are observed roentgenologically as fine mottlings or accentuated bronchial markings. Rales, however, are also absent. Second, the subacute pulmonary infiltrations of Peshkin should be borne in mind. These are usually associated with an asthma, with bronchitis, or in the intervals between asthmatic attacks with bronchitis alone. They resemble an unresolved pneumonia, there is an aggravating cough of several weeks duration, no temperature increase, and disappear within two months without any particular medication.

Treatment. The treatment may be summed up as being that of any condition arising from a tuberculous infection, the well known fresh air, ultraviolet therapy, natural sunlight or artificially produced irradiations and hypernutrition. The important thing to remember is that the occurrence of these infiltrations is dependent upon activity in a tuberculous focus. While such activity is evident through the presence of an elevation in the temperature, rest in bed is indicated. Malnutrition, anorexia or the tendency to tire easily influence the therapeutic regime. Further contact with the source of the infection should, of course, be terminated, and an effort made to avoid, so far as possible, intercurrent infections. Administration of cod-liver oil or viosterol, together with some form of calcium in an effort to hasten calcification of the offending focus, is rational.

Birk and Hager recall several instances, shortly after the end of the World War, when these conditions were but imperfectly understood, in which artificial pneumothorax was resorted to without any apparent harm, but also no benefit. Subsequently they attempted to hasten resolution by repeated applications of roentgen therapy. The result was quite unsatisfactory. It should be emphasized that a proper understanding of benign infiltrations is important in order that the patient may recover because of, rather than in spite of our therapy.

CASE REPORTS

Case 1. C. P., first seen April 12, 1929, at the age of three years. Family history negative; no history of exposure to tuberculosis elicited at that time, but later close contact with an uncle, who apparently had an open case of pulmonary tuberculosis, was found to have taken place for several weeks in December, 1928. Child had always been well until two days prior to coming under observation.

When seen he had a temperature of 104° F., frequent cough, respirations 40 per minute and marked restlessness. Roentgenogram (fig. 1) was negative except for almost complete obliteration of Baum's interspace. Two days later he developed typical evidence of erythema nodosum and was admitted to Doernbecher Memorial Hospital. Bilateral antrum irrigations revealed pus in both antra. Recovery uneventful. Discharged April 23.

May 6. Rash of typical attack of measles appeared, moderate severity, no complications. Convalescence slow and general condition throughout following four months unsatisfactory, the picture being dominated by poor appetite and a tendency to tire easily.

September 25. Appeared with a history of fever of moderate degree of one and one-half weeks duration, during which time cough and pain in the abdomen became progressively more marked. Pleural effusion was apparent on physical examination and a roentgenogram (fig. 2) was made at once. The child was again admitted to Doernbecher Memorial Hospital. He was markedly dyspneic and two aspirations of the pleural effusion were necessary to secure comfort, September 25, 100 cc. and September 27, 250 cc. A roentgenogram (fig. 3) was made after the first aspiration. The fluid was straw-colored and slightly turbid, cell count 1,200, lymphocytes 95 per cent and polymorphonuclear cells 5 per cent.

Report on the specimen sent to the laboratory for animal inoculation was unfortunately not obtainable. Tuberculin test by the Pirquet method was reported as "suggestive positive." Temperature fluctuated between 100.8° F., and 98.6° F. during his six-day stay in the hospital. On September 30 a roentgenogram (fig. 4) was made and the patient discharged with instructions to return weekly to the clinic for child-contacts with tuberculosis for observation.

October 19. Child brought to the clinic for the first time. A roentgenogram (fig. 5) was made and 0.1 mg. of old tuberculin injected intracutaneously. The roentgen findings at this time were no great change in the fluid level, a widening of the entire hilus shadow and a triangular shadow extending from the hilus on the right, bounded below apparently by the interlobar fissure. The local reaction to the tuberculin was two inches in diameter, with actual tissue destruction. There was also a general reaction, high temperature, anorexia and malaise.

November 30. After an absence of five weeks, he returned. Temperature normal. General condition excellent. His mother stated that she had seen no reason for returning, inasmuch as the child had apparently been in perfect health, gaining one-half pound in weight, eating well and having unlimited vitality. Except for the general reaction which followed the intracutaneous tuberculin test, the daily afternoon temperature had been normal since previous visit.

Physical examination revealed dullness in the area of the right upper lobe, distant bronchial breathing but no rales. A roentgenogram made at this time (fig. 6) revealed an opaque shadow, involving the entire right upper lobe and containing what was roentgenologically a possible cavity. The shadow was somewhat mottled, whereas the roentgenogram made two weeks later, Dec. 14 (fig. 7) showed a shadow of almost entirely uniform density. The roentgenogram of Dec. 28 (fig. 8) showed only a further absorption of the pleural effusion.

January 9, 1930. He was sent to Edgecliff Sanatorium, Spokane, Wash., with the diagnosis of epituberculosis. A request was made that frequent roentgenograms be made in an effort to chronologically place the disappearance of the infiltration. Dr. Frank S. Miller very kindly cooperated by making his admission roentgen-ray examination on that date (fig. 9) and another on Jan. 22 (fig. 10), which he sent to me. Fig. 9 shows little other than that the infiltration seems more mottled than in fig. 8, possibly due to a difference in the technic in making the roentgenogram, although such mottling is the rule before resolution of the type of infiltrations under discussion.

January 22 marks roentgenographically (fig. 10) the disappearance of the infiltration. During an interval of thirteen days an apparently complete absorption of the infiltration took place. The temperature during this period fluctuated mornings between 98° F. and 98.6° F., and afternoons between 97.4° F. and 99.6° F. The a.m. pulse varied from 76 to 98 and the p.m. 78 to 90 per minute.

My reports from Dr. Miller do not mention any symptoms worthy of note. On Jan. 28 he wrote that the boy looked very well and he was not confining him to bed.

March 25. A roentgenogram taken on this date by Dr. Miller (fig. 11) shows an almost complete return of the hilus shadow to normal, with but a slight amount of fluid in the right costophrenic angle. Baum's interspace resembled in the actual plate, more the normal than was the case in fig 1, almost a year previously, although this may not be apparent in the accompanying illustration.

Further laboratory findings. At the time of his erythema nodosum, on April 17, 1929, the blood count showed w.b.c. 16,050, neutrophiles 77 per cent, and small lymphocytes 21 per cent. The urine at that time revealed a trace of sugar and a faint trace of albumin. Blood culture was negative. When hospitalized for the tuberculous pleurisy with effusion, the urine (Sept. 26) was negative and the blood count on the same date was reported as, w.b.c. 7,700, neutrophiles 39 per cent, basophiles 1 per cent, lymphocytes 45 per cent, myocytes 2 per cent and monocytes 13 per cent.

SUMMARY

In December, 1928, a child was subjected to close contact with an open case of pulmonary tuberculosis. In April, 1929, at the age of three years, he developed an attack of erythema nodosum. About six months later, he was seen suffering from a tuberculous pleurisy with effusion. After two aspirations of the effusion, 100 cc. and 250 cc. respectively, he was allowed to absorb his effusion spontaneously. Nineteen days later, 0.1 mg. of tuberculin was injected intracutaneously, producing a marked local and general reaction. Five weeks later an infiltration was discovered involving the entire right upper lobe which after eight weeks had apparently completely disappeared.

Discussion. The evidence of tuberculous infection is definite. The occurrence of erythema nodosum, followed in five and one-half months by a tuberculous pleurisy with effusion, raises the much-discussed question of the pathogenesis of erythema nodosum. Symes[43] calls attention to a group of cases which within six months of recovery from an attack of erythema nodosum develop some acute manifestation of tuberculosis, usually in the form of a pleurisy with effusion. He further points out six months after the disappearance of the erythema that the acute process often occurs almost exactly

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[43] Symes, J. O.: Erythema Nodosum and Tuberculosis, Tubercle, 11:154-157, Jan., 1930.

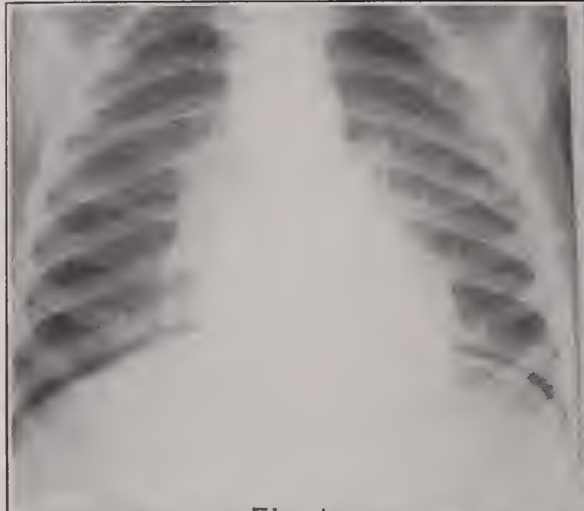


Fig. 1

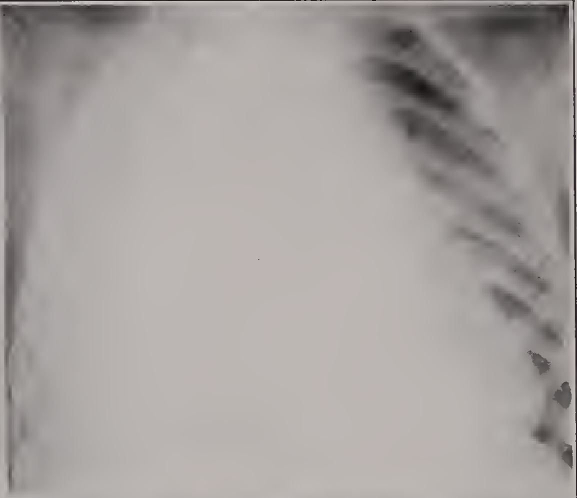
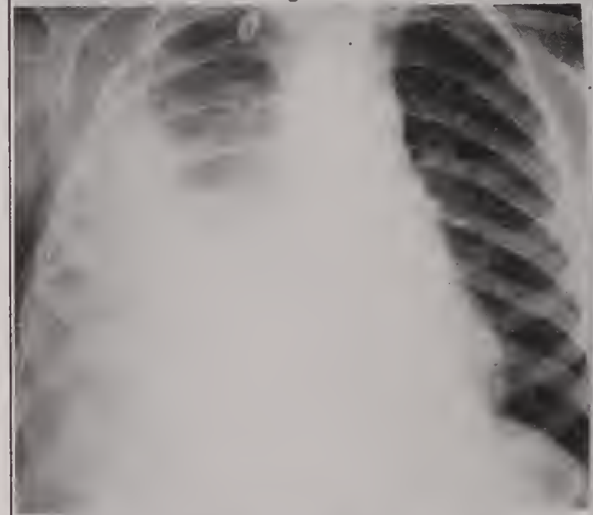


Fig. 2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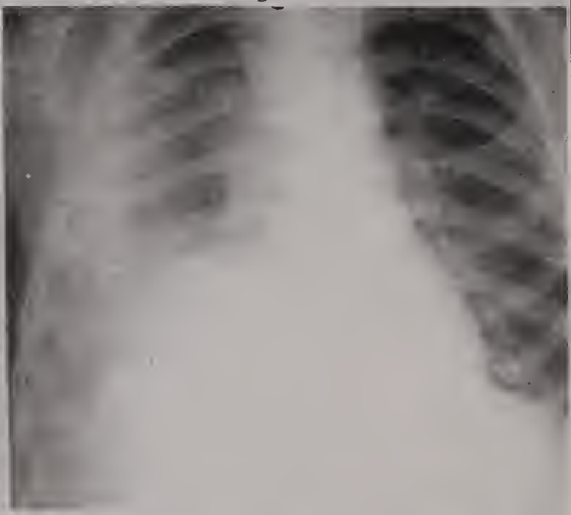
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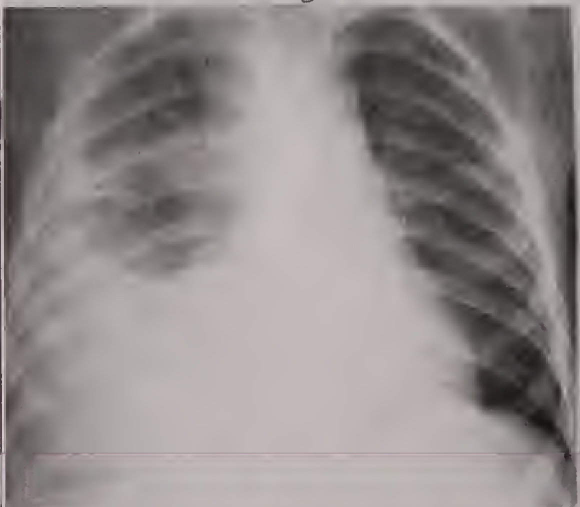
Fig. 5

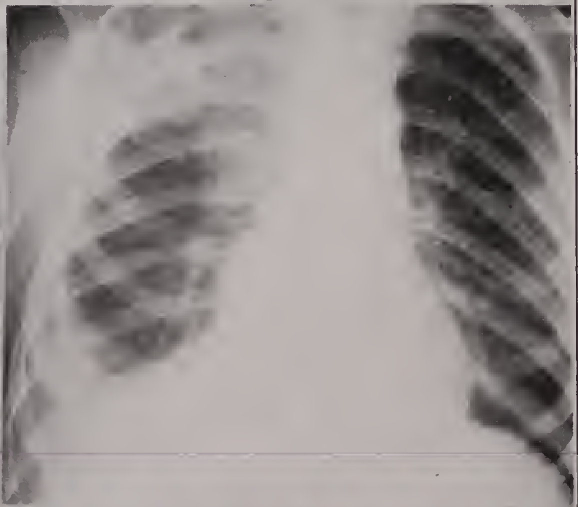
Fig. 6

Fig. 1, Case 1. Roentgenogram made at time of occurrence of erythema nodosum. Right hilus markings accentuated. Almost complete obliteration of Baum's interspace, April 12, 1929.

Fig. 2, Case 1. Roentgenogram made at time of the tuberculous pleurisy with effusion. Displacement of heart shadow to left, September 25.

Fig. 3, Case 1. Roentgenogram made after aspiration of 100 cc. of the effusion, September 27.

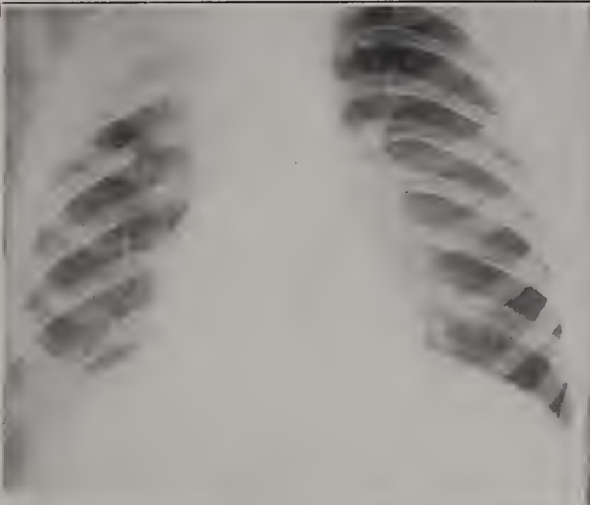

Fig. 7

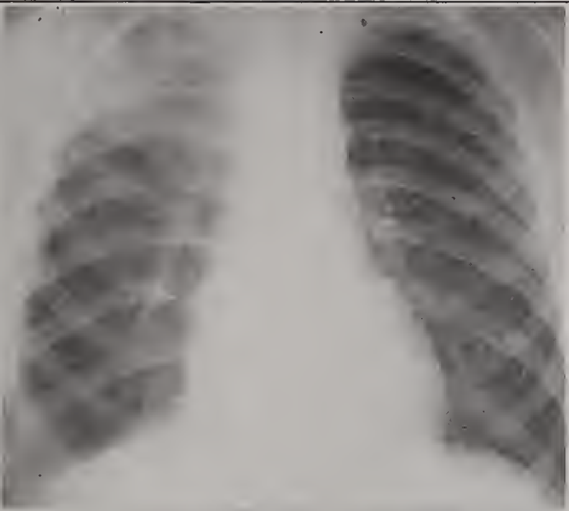

Fig. 8

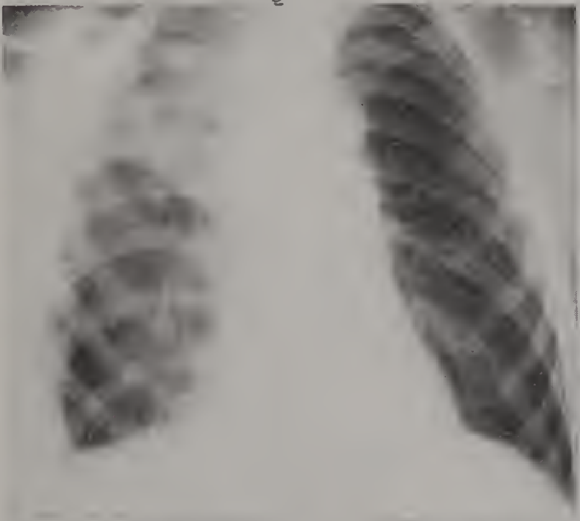

Fig. 9

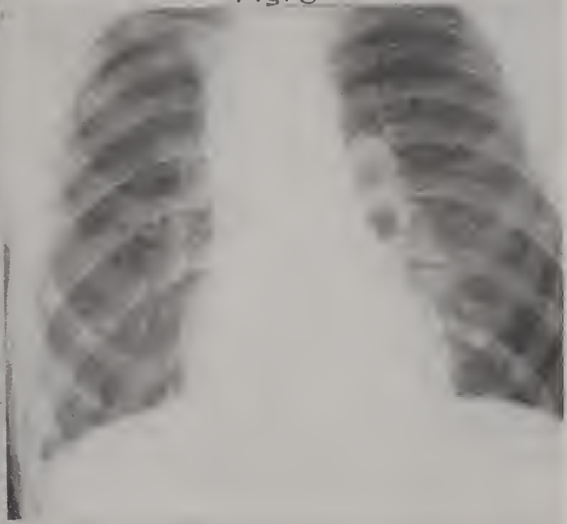

Fig. 10

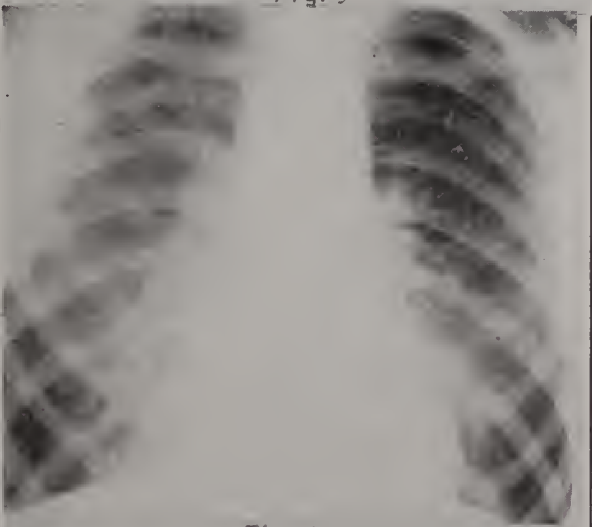

Fig. 11

Fig. 4, Case 1. Roentgenogram made after aspiration of additional 250 cc. of fluid. Note widening of upper mediastinum, September 30.

Fig. 5, Case 1. Roentgenogram made one hour after intracutaneous injection of 1.0 mg. of tuberculin. Note increase in width of mediastinal shadow, October 19.

Fig. 6, Case 1. Roentgenogram showing lobar type of benign infiltration (epituberculosis of Eliasburg and Neuland). Note mottled character of the infiltration, typical of newly developed infiltrations. In the actual film there was what was interpreted as indications of a cavity in the area of infiltration, November 30.

Fig. 7, Case 1. Roentgenogram revealing the infiltration as a shadow of more uniform density. Note the spontaneous lowering of the fluid level, December 14.

Fig. 8, Case 1. Roentgenogram showing area of infiltration presenting once more a mottled appearance, December 28.

Fig. 9, Case 1. Roentgenogram made on admission to Edgecliff Sanitarium. Note mottled appearance of the area of infiltration, indications of beginning resolution in the periphery, January 9, 1930.

Fig. 10, Case 1. Note almost complete disappearance of infiltration thirteen days after previous roentgen examination. Widening of upper hilus still remains. Only slight evidence of fluid remains in right costophrenic angle, January 22.

Fig. 11, Case 1. Two months later than fig. 10. Almost complete return of the hilus shadow to normal. Generalized clouding of right pulmonary area, due to pleural thickening. Small amount of fluid in right costophrenic angle. Baum's interspace resembles more the normal than was the case in fig. 1, almost a year previously, March 25.

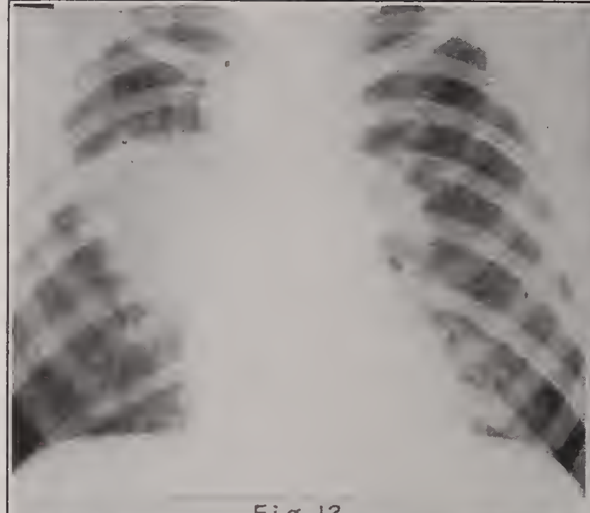

Fig. 12

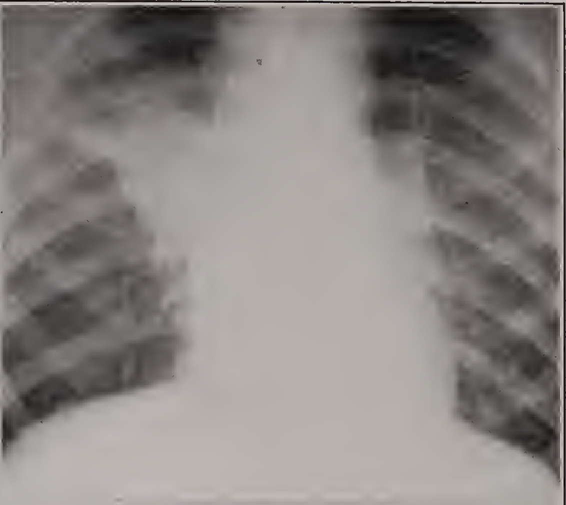

Fig 13

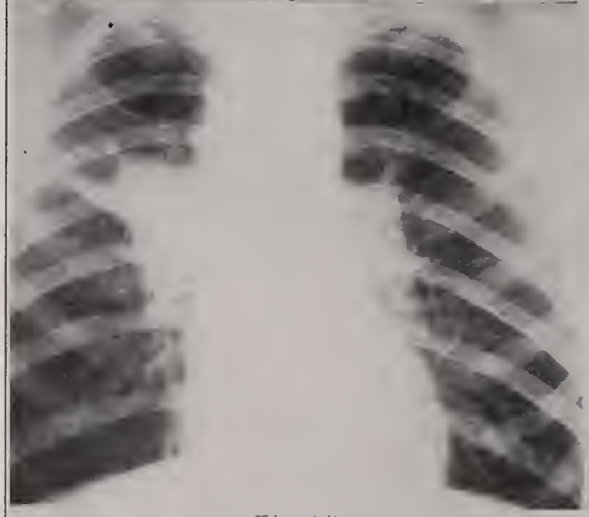

Fig. 14

Fig. 12, Case 2. Right perihilar infiltration in region of middle lobe. Left perifocal infiltration, March 1.
Fig. 13, Case 2. Roentgenogram by Dr. Travis, Klamath Falls, shows diminution in size of perihilar infiltration. Increase may be noted in size of perifocal infiltration with fusion of its borders with the left heart border, March 6.
Fig. 14, Case 2. Roentgenogram shows perihilar infiltration markedly reduced in size. Infiltration on the left is apparently unchanged, August 15.

nodosum and that, even if the danger period has passed, an increased susceptibility to tuberculosis persists, although the attack if it occurs will be less acute. Symes also contrasts the attitude of the profession in Great Britain (which incidentally is that of this country as well) with the opinion of observers in Scandinavia, France, Germany and Austria as to the pathogenesis of erythema nodosum. Ringertz[44] reports two instances of erythema nodosum, followed by death in eight and eighteen weeks respectively as a result of active tuberculosis.

Case 2. L. H., aged 8 years, was admitted on March 1, 1930, to the clinic for child contacts with tuberculosis. Mother has active pulmonary tuberculosis, her illness being of two years duration. Child had been in close contact with her mother who in January had been sent to a sanitarium. Since January 9 she had been observed to cough, unproductively occasionally, and had tired more easily. The onset of the cough was not attended by other evidences of general or local disturbance. She was brought to the clinic simply because she had been a contact.

Her weight, height and temperature were normal. Physical examination was negative, except for large infected tonsils and some dental caries. Tuberculin, 0.1 mg., injected intracutaneously produced a reaction three-fourths of an inch in diameter. A roentgenogram (fig. 12) revealed an area of infiltration about the size of a Japanese orange in the right lung field, extending from the hilus in the region of the middle lobe. What was apparently a perifocal infiltration about a hilus gland on the left was also observed. There was no change in the roentgenographic findings a week later.

The patient did not reappear for examination for a month and, when efforts were made to ascertain her whereabouts, it was found she had been placed on a farm for convalescence, several hundred miles away. Communication resulted in securing roentgenograms (figs. 13 and 14) which were made on May 6 and August 15 respectively. Gradual disappearance of the large perihilar infiltration on the right may be noted, as may an enlargement of the perifocal infiltration on the left, until it has assumed perihilar characteristics. During this period the child was reported as being apparently in the best general condition possible, gaining in weight and temperature- and cough-free. Efforts to secure further roentgenographic reports have since failed. There is little doubt of the eventual disappearance of both infiltrations.

SUMMARY

An eight year old child who had been a close contact with an "open" case of tuberculosis was brought to a clinic conducted for the observation of such patients, with the discovery of a perihilar and a perifocal infiltration. The history indicated that the onset was accompanied by only the slightest abnormal manifestations. Continued observation was made difficult by the removal of the patient to another locality but indicated a gradual disappearance of one infiltration, with extension of the other.

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[44] Ringertz, N.: On the Relationship Between Tuberculosis and Erythema Nodosum, Acta. paediat., 9:51, 1929.

CONCLUSIONS

1. A new name in conformity with the terminology of the American Sanitorium Association is suggested. A modification of the previously proposed classifications of benign infiltrations, occurring on a tuberculous basis, is offered for consideration.

2. The literature of the past forty-seven years is reviewed chronologically.

3. The pathogenesis of benign infiltrations is discussed, consideration being given to the various theories which have been suggested.

4. Clinical characteristics, circumstances under which such infiltrations are discovered, age incidence, onset, course, physical findings, roentgen findings, tuberculin reaction and laboratory findings, as well as diagnosis, differential diagnosis and treatment are discussed in the order named.

5. Reports of two cases are presented, illustrating three types of benign infiltration, namely, lobar (epituberculosis), perihilar and perifocal. One case further raises the question of the relationship of erythema nodosum and tuberculosis.

COMMENT

An effort is made to call the attention of the profession to a symptom-complex which is as interesting as it is poorly understood. Benign infiltrations have been described by many authors during the forty-seven years just past, and though the literature when collected seems voluminous, when scattered through many different journals over such a period of time, it is truly meager. The situation has been further complicated by the multiplicity of names which have been given to the condition. Under a name, conforming with the terminology adopted by the American Sanitorium Association, the subject has been presented in text-book fashion for the first time, to my knowledge, in the American literature.

AGRANULOCYTOSIS: CASE WITH TERMINAL GAS BACILLUS INFECTION. Otis S. Warr, Memphis, Tenn. (*Journal A. M. A.*, Feb. 14, 1931), reports a case of agranulocytosis that is unique, first, because of a terminal gas bacillus infection and, secondly, because the portal of entry for the gas infection was never determined. There was certainly no reason to believe that the gas bacillus entered through the skin.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

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Artificial pneumothorax was first suggested as a therapeutic measure in the treatment of pulmonary tuberculosis in 1822 by James Carson of Liverpool. At that time he did considerable writing on this subject and much experimental work was done on the lower animals. The subject was dropped until 1832, when two English physicians, Houghton and Stokes[1] described cases that had improved greatly following spontaneous pneumothorax. This again revived the subject and reports of similar cases were printed in the literature.

In 1894, C. Forlanini[2] of Pavia, Italy, first successfully performed the operation on man. He reported several cases with good results at that time. In 1898 John B. Murphy[3] of Chicago reported five cases to whom this treatment had been given with good results. A subsequent report of fifty-three cases came from his clinic several years later. The method did not gain favor rapidly in this country. However, Brauer and Spengler[4] of Germany took it up and really placed it on a firm foundation. In 1907 Saugman introduced the use of the water manometer which greatly simplified the operation and lessened the danger of administration. Floyd and Robinson did much work along this line in 1911 and 1912 and since that time the treatment has gained favor rapidly in this country.

The apparatus has been simplified, the technic of the operation has been thoroughly worked out. In fact, there is scarcely any field of modern therapy in which so much scientfic work has been expended as in that of artificial pneumothorax. For various reasons the earlier workers injected nitrogen into the pleural space. It was soon discovered, however, that atmospheric air was just as satisfactory and more easily obtained and for these reasons it has been adopted universally. A most important factor in the development of the treatment has been roentgen-ray. Its use is absolutely necessary in carrying out the treatment successfully. Artificial pneumothorax is in constant use throughout this country and Europe at this time and is recognized by all authorities as a standard procedure in the treatment of selected cases of pulmonary tuberculosis.

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* Published with permission of the Medical Director of the United States Veterans' Bureau, who assumes no responsibility for the opinions expressed or conclusions drawn by the writer.

[1] Moughton and Stokes: Treatise on Diseases of the Chest, New Sydenham Edition, p. 455.

[2] Forlanini, C.: Die Behandlung der Lungenschwindsucht mit dem kunstlichen Pneumothorax, Ergebn. d. inneren Medizin u. Kinderheilkunde. 9, 621-655, 1912.

[3] Murphy, J. B.: J. A. M. A., 21, 151-208-341, 1898.

[4] Bauer and Spengier: Die operative Behandlung der Lungentuberkulose. Handbuch der Tuberkulose, Band III, V. Johann Barth, Leipzig, 1919.

Since rest is the predominant factor in the treatment of tuberculosis, it would seem that local rest would be ideal. The lungs are never at rest, which probably is one of the contributing factors causing such a high mortality in pulmonary tuberculosis. Therefore, if we can, by the administration of artificial pneumothorax, place a lung at partial or complete rest, we have accomplished a great deal toward the patient's recovery. It is known that a congestion of the pulmonary circulation occurs when the lung is collapsed. This produces a marked increase in the fibrous tissue of the lung, the very result we desire in the healing of a tuberculous lesion. Many of the smaller vessels of the circulatory and lymphatic systems become closed and in this way the lesions are blocked off, so to speak. This lessens greatly the danger of an extension of the lesion in the lung and prevents the spread of toxins into the general system.

Another important factor is that, when the lung is compressed, the inflammatory exudates in the alveoli as well as the contents of cavities are squeezed out of the lung, thus removing one of the main sources of toxin. An open cavity is a great danger. Most spreads of consequence are bronchiogenic in type and are primarily due to the presence of cavities. The larger ones nearly always contain fluid and are continually becoming infected with mixed organisms, causing a constant drain on the patient's vitality. Hemorrhage is also a danger in this type of case. If a satisfactory collapse is obtained, the walls of the cavity will be compressed and in most cases fibrosis and healing will occur with complete obliteration of the cavity.

The pricinpal uses of pneumothorax are to collapse the lung so that complete rest may be obtained and to compress and obliterate cavities. There is no question but that pneumothorax speeds recovery and lessens the period of invalidism and many of the later writers are advocating its use in nearly all cases of pulmonary tuberculosis where it can possibly be given.[5] Of course there cannot be any fixed rule in the selection of cases. However, one large institution[6] gives pneumothorax to all patients who have a cavity or cavities as large or larger than 2 cm. in diameter, or heavily involved areas without cavitation that have shown no improvement after a suitable period of observation has passed, provided, of course, that there are no contraindications present. Cases at this institution that come in with a pneumonic type of involvement are as a rule compressed immediately.

It is advisable at times to give the treatment to patients having a large amount of involvement in both lungs. The lung containing the most involvement is, of course, selected for collapse. Some of these cases do well and in some instances recover. Many of them at least are made more comfortable. Pneumothorax is valuable in controlling severe pulmonary hemorrhage. If the site of the hemorrhage has been definitely determined, and sufficient air induced in the pleural cavity of the side involved, the hemorrhage in most cases will be arrested.

There are several types of cases in which pneumothorax is not indicated, although the line is at times hard to draw and the contraindications are not as numerous as formerly believed. A lesion in the opposite lung is by no means a contraindication. In fact, in a recent report from one of the larger institutions, the selected cases of bilateral tuberculosis did about as well under the treatment as the unilateral cases. In old fibroid phthsis with pulmonary emphysema the treatment should never be attempted.

Neither should it be attempted in the presence of valvular heart disease, unless the heart is fully compensated. The right side of the heart is subjected to an extra load when the lung is compressed, due to the blocking or partial blocking of the pulmonary circulation. In view of this fact one should be very careful in selecting cardiac cases.

Cyanosis is a contraindication, as is dyspnea, as a rule, although some of the cases are due to toxemia and may be given the treatment successfully. Generally speaking, pneumothorax is not satisfactory in childhood, old age, diabetes, syphilis, nephritis and pregnancy.[7] Negroes and other races of low resistance do not as a rule do well under this treatment, although the writer has given pneumothorax to two negro patients and at the last report, nine months later, they were both doing quite well.

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[5] O'Brien, E. J.: The Indications for the Surgical Treatment of Pulmonary Tuberculosis. Am. Rev. Tub., Nov., 1929.

[6] Cooper and Stallings: A Study of 418 Cases of Pulmonary Tuberculosis Treated by Artificial Pneumothorax. Am. Rev. Tub., November, 1929.

[7] Bruns, E. H.: Lectures Fitzsmons General Hospital, Denver, Colo.

The apparatus in common use is that worked out by Floyd and Robinson. It is a modification of the Brauer apparatus and is most satisfactory. It consists of two graduated water bottles of 2000 cc. capacity, each connected with tubing. The bottles are arranged on a stand so that one may be elevated more than the other. The elevated bottle is filled with tap water which is allowed to flow into the empty bottle on the left. This forces out a corresponding quantity of air through tubing into the needle that has been placed in the pleural space. The gauge or manometer is situated on the stand with the bottles, and is so arranged that the operator may connect it directly with the air in the pleural space or by turning a cock it may be cut out entirely. The manometer is a U tube about one cm. in diameter, each arm approximately twenty cm. in length and graduated. It is filled half full of red ink. The right hand arm is the one from which the reading is obtained. A negative pressure, of course, would cause the column to move upward while a positive pressure would lower it. It is gauged from the level of the fluid in the tube which stands at zero to eight points above and eight points below.

The method of administration now in universal use is that originally devised by Forlanani and is the puncture method. The site usually employed is situated between the anterior and posterior axillary line in the fifth or sixth interspace. The chest wall is thin at this point and is very suitable for the puncture. The object in view is to obtain a free pleural space. This would not be in the region where pathology is or has been present. The operator may use his judgment accordingly and may make the puncture at any site he deems best.

The operation should be done under local anesthesia. Strict asepsis should be observed. A blunt needle should be used when the first attempt is made. There are several reasons for this. A needle that is sharp passes quickly through all the tissues of the chest without resistance and may go into the lung and lacerate that organ. A blunt needle, on the other hand, requires considerable pressure to press through and an experienced operator will have little difficulty in identifying the various structures as the needle passes through the chest wall.

A needle with a bore of not less than 1.5 mm. should be used for the initial fill. There are several types of needles on the market, devised to simplify the operation and lessen the danger of accident. One such needle has the opening on the side, similar to a sewing machine needle. It is very successful and is in wide use. The writer pushes the needle slowly through the chest wall, and when the parietal pleura has been reached, the manometer may be connected with the needle and as this is punctured a negative reading will be obtained. This usually shows an oscillation of from minus three to minus four or from minus four to minus seven. If the lung is punctured, a reading of minus two to plus two is usually obtained.

The amount of air that is injected for the first time varies according to the size of the chest and the condition of the patient, from two hundred to four hundred cc. The treatment is repeated every day for three days, then every week for several weeks. When the degree of collapse that is desired is obtained, the treatment may be arranged so that the lung may be held in this condition. It requires usually a refill every two weeks of from four hundred to six hundred cc. of air to maintain the average collapse. After six or eight months treatment the patient may be able to go longer without refills. A close check with the fluoroscope should be made after each refill.

The degree of collapse desired depends on the type of involvement present. Observers have noticed for years the selective action of air on a diseased lung. When air is first placed in the pleural space, that portion of the lung which shows only a small amount of involvement very promptly collapses, while the heavily involved areas show no compression. After a few days or weeks of the treatment the heavily involved areas will begin to collapse. When the desired amount of collapse has been obtained in the diseased portion, the pressure may be held up for a while, in which case that portion of the lung that has only a small amount of involvement and has not lost its elasticity will very promptly expand. The heavily involved areas will remain down a much longer period of time.

In this way a lung with a heavily involved upper lobe may have this area completely compressed, while the lower lobe is out and functioning properly. This is a very valuable feature of the treatment and enables us to give it in many cases that have only a limited amount of breathing space. The lung is usually kept collapsed for a period of two years, although some cases go much longer than this. The writer has seen one case that had the right lung collapsed for a period of seven years and one year after the treatment was discontinued the lung had reexpanded.

When it has been decided to reexpand the lung, the intervals between treatments may be lengthened and the amount of air decreased. In this way the lung will be allowed to reexpand very slowly and if signs of reactivation appear the treatment may be resumed. The average case will reexpand in five or six months or longer, according to the amount of involvement that was present and the length of time the lung has been down. Most cases will not expand completely, however. The chest wall will retract, the diaphragm rise and the mediastinum will swing to the collapsed side. In this way any dead space will be obliterated and the patient will have a small good lung.

The most common complication encountered in the treatment is pleural adhesions. This is present in a large percentage of cases. In fact, reports from various institutions show that a successful collapse is prevented in at least one-half of the cases by this condition. Many cases will show only a single adhesion holding open the cavity of diseased lung, and in some of these this may be cut and a successful collapse obtained. By the use of high pressures adhesions may at times be separated successfully. There is a tendency among most workers at this time to discontinue pneumothorax after several months trial, if adhesions interfere with the collapse and resort to other means of lung compression.

Hydrothorax is a frequent complication. It occurs in from forty to sixty per cent of all cases treated, and in those receiving the treatment for a period of a year or more, it is almost certain to develop more or less. The cause of the formation of fluid is not thoroughly understood. Some authorities are of the opinion that it is due to a reinfection of the pleura, caused by the liberation of tubercle bacilli when adhesions are separated. Others believe it is caused by a disturbance of the lymphatic system, the compression of the lung resulting in a backward flow of the lymph with a consequent scattering of tubercle bacilli through the pleura. The disturbance of the circulation has also been named as a cause, the fluid forming as a result of a localized edema. Some of these cases show no ill effects, while others become acutely ill. Many never require aspiration. In fact, a case should never be aspirated unless there is some indication, such as displacement of the heart and mediastinum or symptoms of extreme toxemia or dyspnea. Strict asepsis should be observed when the fluid is aspirated, as there is always the danger of mixed infection with the consequent development of a pyopneumothorax.

Spontaneous pneumothorax is a dangerous complication at any time and in the presence of an artificial pneumothorax is probably more serious than in a case that has not been compressed. It occurs more frequently in artificial pneumothorax for several reasons. During the process of compression a small adhesion may tear into the visceral pleura. This does not happen often when proper precautions are taken, although at times it is unavoidable. If a tubercle is present on the visceral pleura and becomes caseous and breaks down, there is hardly a chance of the perforation closing before damage is done. When the pleura is against the chest wall the chances of adhesions forming between the visceral and parietal pleura are fairly good and in this way no damage occurs.

A case with this complication presents a most characteristic picture. A severe pain on the side affected develops quickly, dyspnea and cyanosis appear and the patient goes into extreme shock. The heart and mediastinal contents are displaced to the opposite side and, unless the air is removed from the pleural space, death ensues. In the less serious cases only slight symptoms develop and the presence of the complication may be determined only by the aid of the roentgen-ray.

In the valvular type a small piece of pleura acts as a valve over the rent in the lung. As a consequence the patient "pumps himself up" and in this type of case it is often necessary to place a needle in the pleural space and leave it there so that the air may escape until the valvular action ceases. In the less severe cases the air should not be removed, as there is a chance that the compression of the lung will tend to close the fistula that has developed. This complication occurred thirty-three times out of a series of four hundred eighteen cases recently reported. Three of these cases died instantly, six of them developed a pyopneumothorax without permanent bronchial fistula and were treated by the closed method. Twelve of them remained with a permanent bronchial fistula and later had open drainage done. Twelve escaped serious complications.

Air embolism occurs occasionally during the administration of the treatment. Some writers have described the symptoms associated with this condition as being due to pleural shock. However, during the past few years investigators have decided that in most instances the symptoms arising during the administration of the treatment are due to an injection of air into the blood stream. This is produced by laceration of a vein that is a part of or connected with the pulmonary veins in the lung. The air is carried to the left heart and is promptly scattered through the circulatory system. If the coronary vessels become involved, death occurs immediately. If the cerebral vessels are involved, the patient immediately becomes unconscious; tonic and clonic convulsions may develop and the patient may die within a few minutes or hours. The writer has seen these symptoms persist for two days with ultimate recovery. The treatment is symptomatic. If care is taken to prevent laceration of the lung and high pressures are avoided as often as possible, this complication will rarely occur. In the series of cases before mentioned it appeared ten times with seven recoveries and three deaths. It was estimated that practically ten thousand operations had been done in this series. Most of the accidents occurred in those cases that did not have a definite air pocket established in the pleural space.

Emphysema of the tissues of the chest, neck and face may occur, due to the leaking of air from the pleural space through the puncture wound. This is a disagreeable complication but is of no serious consequence.

The contralateral lung shows various changes when the other is collapsed. Pulmonary emphysema always occurs more or less. The alveoli and bronchioles are dilated, permitting almost as much air to pass through as before. This compensatory change occurs during the first few months of the treatment, while the patient is in bed, and, as a rule, the adjustment has been made by the time he becomes ambulant. As a consequence he hardly ever has respiratory embarrassment on usual exercise. The writer has known many patients undergoing the treatment in the Denver district who have taken the trip up Pikes Peak and have had no more difficulty there than a normal person.

As stated before, lesions in the contralateral lung do not contraindicate pneumothorax. The type of case with a small amount of involvement in the opposite lung does quite well under the treatment. In the cases that show a large amount of involvement of the caseofibrous type many will show improvement after the most heavily involved lung is collapsed. Many investigators[8] have written on this phase of the work and in their reports the contralateral lung shows improvement in from twenty to forty per cent. An extension of the process to the good lung appears occasionally. However, there is no question that this occurs more often in those cases that have not been compressed and have open cavities or heavily involved areas in the opposite lung.

The immediate results of the treatment are striking. In successful cases the temperature falls, cough and expectoration decrease or cease, tubercle bacilli disappear from the sputum, dyspnea will disappear if it is due to toxemia and the patient will improve generally. The lung clears rapidly, exudative lesions resolve like an ordinary pneumonia and cavities heal permanently.

The question arises, are the results permanent? They should be as permanent as in the other forms of treatment, and it should be borne in mind that it is often instituted after other methods have failed. There have been numerous reports of series of cases treated by artificial pneumothorax during the past ten years. Saugman has reported three hundred cases; the Laennec Hospital of Paris over six hundred cases; the Matsons of Portland, Oregon, four hundred eighty cases; Andrew Peters of Loomis Sanatorium, New York, over four hundred cases; Leroy Peters of Albuquerque, New Mexico, seven hundred cases; Kendall and Ross five hundred cases; Cooper and Stallings of Denver four hundred eighteen cases.

The results in all of these series vary only slightly. Saugman[9] was able to follow his cases from 1907 to 1921. He had a total of three hundred ten cases originally. There were two hundred eighteen of them that carried on the treatment as he directed and in ninety-two cases the treatment was given up for various reasons. Of the two hundred eighteen cases there were seventy-four able to return to their work, and of the ninety-two cases that gave up the treatment only ten were able to return to work. The Matsons[10] report forty-eight per cent of their cases as clinically well. These had received a satisfactory collapse. Peters[11] reports thirty-three per cent of all his cases, regardless of the type of collapse, as clinically well.

The report from Fitzsimon's Hospital does not give a follow-up record. However, some of the information from this report is very complete and a definite idea of the value of the treatment may be obtained from it. There were four hundred eighteen cases reviewed in this series. A satisfactory collapse was obtained in forty-nine per cent. Of these cases sixty-one per cent showed general improvement. There was a decrease in cough and the amount of sputum raised and it became negative in approximately fifty per cent. Fifty-one per cent of these cases are at this time in the hospital. Forty-one per cent have left and are unaccounted for, while only seven per cent have died. Of the cases that received an unsatisfactory collapse, fifteen per cent are dead, while only thirty per cent were able to leave the hospital. These figures may not appear flattering, but we should remember we are dealing with a disease that has a terrific mortality.

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[8] Matson, Matson and Bisaillon: Observations on the Contralateral Lung. Am. Rev. Tub., January, 1925.

[9] Sangman: Dauerresultate der Pneumothoraxtherapie bei Lungentuberkulose. Carpi. Handbuch der gesamten Tugerkulose-Therapie. Band. 11z. 1713.

[10] Matson, Matson and Bisaillon: End-Results of 600 Cases of Pulmonary Tuberculosis Treated by Artificial Pneumothorax. Am. Rev. Tub., June, 1924.

[11] Peters, L. S.: A Study of 700 Cases of Pulmonary Tuberculosis Treated by Artificial Pneumothorax. Nat. Tub. Assn. Transcript, Vol. 24, 163-167-28.

It has been shown that eighty to ninety per cent of all cases of pulmonary tuberculosis die with the disease or its complications and that the average adult life with it is from two to four years. Lawrason Brown,[12] in Tice's "Practice of Medicine," states that only thirty per cent of all far advanced cases will recover sufficiently to resume their work. This, of course, includes all cases treated by bedrest alone as well as pneumothorax.

There is no question in the minds of physicians who are in this work that an increase in the number of cases recovered will be noted in the next few years, as the doctors throughout the country become more familiar with this treatment and advise its use more often. To quote Brown, "It may now be said that artificial pneumothorax is the greatest advance in the therapy of tuberculosis which has been employed in recent years, and its importance is all the greater as it is applicable and lends its greatest field in those cases which are past the incipient stage and in which the course of the disease is progressive."

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[12] Brown, Lawrason: Tice's Practice of Medicine, Vol 2, p. 550.

Complete Rupture of Supraspinatus Tendon. An experience with ten patients with complete rupture of the supraspinatus tendon in a period of eighteen months had impressed Philip D. Wilson, Boston (*Journal A. M. A.*, Feb. 7, 1931), with the frequent occurrence of this injury. The pathologic observations at operation indicate gradual weakening of the tendon previous to rupture. The lesion should be suspected in any patient who gives a history of shoulder disability of sudden onset and particularly when a painful snap has occurred during a movement of abduction or when there has been a fall on the shoulder with or without dislocation. The characteristic sign of rupture is inability to abduct actively while this movement may be executed passively. This sign may be masked by muscle spasm or adhesions. Repair of the tendon is difficult by the capsular gap and it is important not only to suture tendon but to facilitate a real bony attachment.

ARTIFICIAL PNEUMOTHORAX IN THE HOME TREATMENT OF PULMONARY TUBERCULOSIS*

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Despite the fact that compression therapy has won for itself an important place in the salvage of unpromising cases of pulmonary tuberculosis, it still remains unavailable to a large proportion of patients.

Medical directors of American sanatoria are unanimous in deploring the circumstance that a majority of patients who present themselves for institutional care suffer from well advanced stages of the disease. Only a varying small percentage receive the full benefit of artificial pneumothorax because of old and extensive pleural adhesions, or because the disease has progressed to a relatively serious degree of bilateral involvement.

Most patients receive their early diagnosis and treatment from family physicians. In the state of Washington thirty of 1900 physicians use collapse therapy, and twenty of these are in the cities of Seattle, Spokane and Tacoma. Excepting specialists in other fields who do not treat tuberculosis, an overwhelming majority of physicians remain in and out of the larger cities who rely solely upon the classic "rest, fresh air and good food" regimen.

Every patient should be given a trial with this conservative regimen before surgery of any sort is exhibited. But at the present time, most practitioners rely upon conservative means for too long a period. I mean that by the time the patient is referred to an institution he has passed the stage at which pneumothorax and an institutional routine operate with maximum effectiveness.

The obvious solution is either to shorten the expectant trial at home or to introduce artificial pneumothorax (and phrenicectomy and thoracoplasty) into the "home" treatment at an earlier stage of the disease than is now possible in sanatoria. In properly selected cases artificial pneumothorax may be maintained as safely and effectively at home as in a sanatorium. As an operation it presents no more difficulties than aspirating a chest.

SELECTION OF CASES

The ideal case for pneumothorax at home is a young adult in fair general condition, having the disease confined to one side of the chest. If the contralateral lung has determinable activity upon physical or roentgenographic examination, the case should be given the benefit of sanatorium observation.

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* Read before Whatcom County Medical Society, Bellingham, Wash.

QUANTITY OF INJECTIONS

The commonest error of operators is the attempt to achieve a rapid and complete collapse of the affected lung. In the beginning it is more prudent to strive merely for the relief of symptoms. In most cases injections just sufficient in quantity to secure a separation of the pleural surfaces will produce this result. The lung need not be totally collapsed for six months. In the meantime the contralateral lung may be carefully watched for physical signs which would suggest its inability to bear the added burden. It will adjust itself most successfully, if the burden is imposed slowly.

It is manifestly impossible to formulate a set of rules which would apply to every case of tuberculosis. But it is possible to suggest a sequence of injections which may be used as a guide for the management of the average well selected case. The individual operator will vary the order as expediency dictates. First day, 250 cc., third day 250 cc., fifth day 250 cc., eighth day 250 cc., eleventh day 250 cc., fifteenth day 300 cc., twentieth day 300 cc., weekly intervals for two months 300 cc., ten day to two week intervals for three months 500 cc.

Eventually refils may be given at three to four week intervals, the length of the interval to be determined by considering the patient's symptoms in relation to his demonstrated power of healing during the period of observation, together with the manometer impulse at the time of refil, and roentgenographic or fluoroscopic evidence of reexpansion of the lung.

"Home" cases may report to the physician's office or local hospital for refils after the third or fourth. Thus, observation may be more accurately controlled by frequent fluoroscopic examinations, though it is possible to maintain a competent observation over a three or four month period by physical signs alone. Physical signs are more reliable than roentgen-ray studies in detecting the earliest changes in the contralateral lung.

A compressed lung gives the patient an increased latitude in the matter of activity, but those cases profit most who persist in the "rest cure" for six months to a year while pneumonthorax is being administered. Favorable cases require compression and immobilization therapy for one to two years. When it is felt by the clinician that artificial pneumothorax has served its purpose it may be discontinued with carefully graduated, diminishing quantities of air.

INITIAL COMPRESSION

The first injection may be made according to the following procedure:

The patient lies on his good side near the edge of a bed or table. His head should be unsupported by pillows, but a pillow or two may be placed under his good side. This will bow his chest, effecting a better separation of the ribs on the diseased side.

If the operator palpates upwards between the anterior and posterior axillary lines from abdominal tympany or dulness he will encounter a half dozen rib interspaces which will serve as entrance sites. The fifth, sixth or seventh interspaces are admirable. Failing in these he may select any point on the chest surface.

A cross is marked on the skin surface, and a three or four inch area around it painted with tincture of iodine. To secure analgesia for the path of the needle, a 3 cc. ampule of ½ to 2 per cent novocaine suprarenin solution is injected with a small gauge one and one-half inch needle. When anesthesia is complete the skin is penetrated with a pointed Bard-Parker knife blade to a depth which will insure the easy passage of the blunt, short beveled, 18 gauge, two inch needle used to administer the air. This needle is attached to a sterile glass adapter connected to a 76 cm. length of ordinary gum rubber stethoscope tubing, which in turn is connected to the manometer.

The operator receives warning that he is in the pleural cavity from the feeling of the needle as its dull point penetrates the taut pleura, and by a prompt negative oscillation in the manometer. When he is certain the needle point is in the pleural cavity, the rubber tube is transferred to the glass tube marked F (fig. 1). Syphonage is established by raising syphon bottle H, and air flows with even pressure into the pleural cavity.

The relatively dull, short beveled needle is recommended for the initial injection for the reason that a sharper instrument might penetrate or tear the moving lung pleura. For subsequent refils the long bevel is not interdicted. The two pleural surfaces will be separated by a safe hiatus.

THE MANOMETER

The voluminous literature on compression therapy contains many suggestions as to the standardization of manometric readings. Authorities, however, are not yet agreed as to whether water, oil, gly-

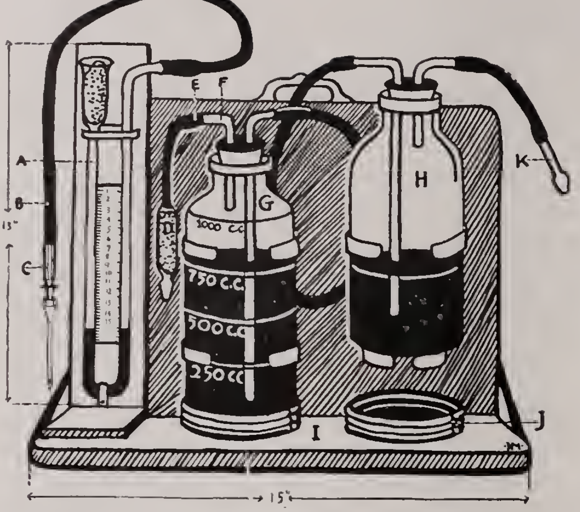

Fig. 1. Simplified apparatus for the administering of air in compression therapy of tuberculosis. A, manometer; B, gum rubber tubing; C, glass adapter; D, glass canula; E, gum rubber tubing; F, short glass tube; G, H, ordinary stock bottles of one liter capacity, fitted with two hole rubber stoppers, and long glass (4 mm.) tubing to size; I, carrying board; J, metal lids for additional stability.

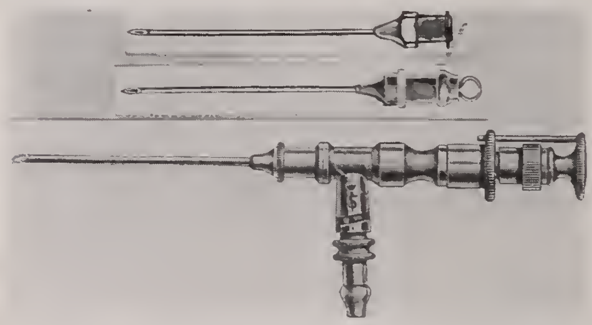

Fig. 2. Examples of long beveled needles and special 18 gauge, two-inch, short beveled pneumothorax needle for initial injections.

cerine, or mercury is the best medium for manometric use; nor is there any unanimity in the opinions on needle bore, manometer bore, etc. Up to the present time no one has elaborated a satisfactory set of rules by which manometer readings may be used arbitrarily to guide the quantity of air to be injected. The manometer is most useful, not by giving an accurate estimate of positive or negative pressure, but by indicating whether the pressure *is* positive or negative. If the oscillation shows negative pressure, the injection of air may be safely made. It is prudent to permit the intrathoracic pressure to remain slightly negative for the first four to six months of treatment.

Patients may be warned to expect an "aching" and "soreness" in the compressed lung for forty-eight hours following the initial injection.

REFILS

For refils the same technic as for the original injection may be used except that instead of two, only one 18 gauge, two inch, long beveled needle may be used. It is first used to inject the anesthetic. When it has attained the pleural cavity, it is permitted to remain in position while the syringe is replaced by a glass adapter already connected with the manometer (fig. 2).

For nervous patients it may be necessary to "freeze" the site of entry with ethyl chloride before penetrating the skin with the Bard-Parker blade. When the injection is completed the needle is withdrawn, the site cleansed with 80 per cent alcohol, and a small dressing left in place.

The majority of patients will require one-half grain of codeine sulphate one hour before the operation. When suggestive symptoms of activity supervene a short time preceding a refil, it may be taken as an indication that the interval between refils should be shortened.

SIMPLIFIED APPARATUS

For home and office use a portable apparatus has been designed by the author. Exclusive of needles it may be constructed for less than four dollars. The parts to be sterilized fit easily into an office sterilizer or small pan on the kitchen range. It is distinctly a one man appartus.

As sketched (fig. 1) it consists of:

A. The manometer, a U tube of 4 mm. bore.

B. Gum rubber tubing, bore, 4 mm.

C. Glass adapter to fit standard 18 gauge needle.

D. Glass canula. Width, 1½ cm.; length, 8 cm.; filled with sterile cotton.

E. Gum rubber tubing.

F. Short glass tube for conduction of "sterile" air.

G, H. Ordinary stock bottles of one liter capacity, with two hole rubber stoppers, and long glass (4 mm.) tubing to fit.

I. Carrying board with handle and steel spring (bicycle) clips to secure bottles.

J. Metal lids to give additional stability to bottles in carrying.

A small quantity of mineral oil may be used in the manometer tube. A liter of 1:1000 colored mercury bichloride solution will serve for the syphon bottles. If this solution is permitted to remain in bottle G while the apparatus is not in use, the bottle may be regarded as sterile for pneumothorax purposes.

To fill bottle G with "sterile" air, lower bottle H and start syphonage by sucking on tube K. Air is filtered through D and sterilized tube E.

SUBCUTANEOUS EMPHYSEMA FOLLOWING BRONCHOPNEUMONIA OF THE INFLUENZAL TYPE*

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and
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Subcutaneous emphysema as a complication of bronchopneumonia is a comparatively rare entity and for that reason we are reporting this case. A comprehensive study of this complication was published by Berkeley and Coffen[1] as a result of their experience with influenza and bronchopneumonia at Camp Lewis during the late war. They took up the rarity of the condition and offered a logical explanation for its mechanism.

Our patient, Mr. P., age 23, white, came in to the hospital in coma and exhibited stertorous breathing. His illness had started two days previously, although there were no definite complaints until the afternoon of the day of his admission. His history showed that he had been taking some questionable alcoholic drinks on Saturday afternoon. However, on Sunday he worked all day as a truck driver and seemed normal until Sunday afternoon, when he felt nauseated and vomited. At 5:00 a.m. Monday, the day of admission, he awakened and complained that his left side seemed paralyzed and his tongue felt thick. He vomited after breakfast. During the morning he was restless and had frequent severe chills. In the afternoon he became comatose, his breathing became rapid and his temperature began to rise. He was sent into the hospital at this time.

The past history was unimportant. The physical examination showed a well nourished and well developed young male in coma. Breathing was stertorous and was interrupted with periods of apnea. Following these periods the respiratory effort was marked. There were spells of tonic and clonic spasms of all of the muscles of the body, although these were not marked. The jaw was tonically contracted. The head showed no evidence of trauma. The left pupil was larger than the right. The mouth could not easily be opened. The neck was negative upon the entrance examination but within two or three hours it was noted that there was a fulness of the subcutaneous tissues from the clavicle half way up, on each side of the neck anteriorly. The tissues had a crepitant feeling and subcutaneous emphysema was diagnosed.

The chest showed all accessory muscles of respiration being used with definite difficulty on expiration. The lungs showed impaired percussion in the bases but this was more marked on the left than on the right. Over the left base bronchovesicular tones and showers of subcrepitant rales were heard. Coarse mucous rales could be heard almost any place in the chest. The heart was negative. The abdomen was rigid. The extremities showed increased spasticity. Cyanosis was noted beneath the finger nails.

The neurologic examination showed paralysis of the left side of the face. The reflexes were hyperactive. Babinski's sign was positive on both sides. Kernig's sign was positive. Ankle-clonus was noted on both sides. The neck was not stiff.

A catheterized sample of urine showed 3 plus sugar; all other findings were negative. This urine, however, was taken about thirty minutes after a concentrated solution of glucose had been given intravenously. The blood count was normal with the exception of 32,000 white blood corpuscles which showed 89 per cent polymorphonuclears of the neutrophilic type. The spinal fluid was found to be under no increased pressure and was clear. The eye grounds were negative.

The progress was rapid and fatal, death occurring the next morning. The autopsy showed serosanguineous bronchitis, hemorrhagic bronchopneumonia of the influenzal type, subcutaneous emphysema, and hyperemia of the brain with moderate edema. A close inspection of the thoracic cavity revealed the right lung to be pale anteriorly over the upper two lobes with some accentuation of the lobular markings and the left lung to be somewhat collapsed so that the hilus was plainly visible. About the hilus of both lungs, but more marked on the left, there was a crepitant loose tissue, giving the appearance of small clumps of soap bubbles. The same was true of the entire anterior surface of the pericardium and extended superiorly through the mediastinum and up into the neck. There was no gross evidence of any injury. The entire lower lobe of the left lung was nodular and firm. Its pleural surface was pale and purplish red in color and sections were dripping wet and bloody. There were nodular firm areas of consolidation throughout. The right lung showed similar changes but much less marked. The apices of both lungs were somewhat emphysematous.

707 Stevens Building.

VOMITING IN INFANCY*

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Persistent vomiting in infants is a frequent and often a difficult or grave problem. The discussion of all the varied causes of persistent vomiting is too broad a subject to be considered here. The purpose of this paper is to present information of clinical value on that type of vomiting which Cameron[1] has ascribed to an incoordination between the infant's highly organized gastrointestinal system and his markedly unstable nervous system.

THE NERVOUS SYSTEM OF THE INFANT

The infant's nervous instability is a common clinical observation. Every physician is familiar with the difficulty he often encounters in attempting a physical examination on an organically normal infant who intermittently and without warning or apparent cause will suddenly cry or scream, keep the entire body tense, rigid and hypertonic, kick the feet, wave and jerk the arms, clench the fists, and even retract the head. After about three months of age this same hypertonic infant becomes increasingly relaxed and more easy to examine. All of these inhibitions are intensified or prolonged in the infant who is made nervous from too much tension or attention in the home.

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* From the Medical Service of the Multnomah County Hospital and Department of Medicine of the University of Oregon Medical School.

[1] Coffen, T. Homer and Berkeley, Hugh K.: Generalized Interstitial Emphysema and Spontaneous Pneumothorax. J. A. M. A., Vol. 72, pp. 535-539, Feb. 22, 1929.

* Read before the Forty-first Annual Meeting of Washington State Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

[1] Cameron, H. C.: Vomiting in Infancy. Brit. M. J., 1:765. April 25, 1925.

NERVE CONTROL OF THE GASTROINTESTINAL SYSTEM

The lack of nervous inhibition in many small infants may not only be external and manifested by this generalized outward hypertonicity, but it may occur internally, affect the nervous control of the intestinal tract, and result in persistent vomiting. The intestinal tract has a double and antagonistic nerve supply, in which the inhibiting fibers pass in the splanchnic nerves and the stimulating fibers pass in the vagus.

The intestinal tract is also under the control of the cerebral centers. Evidence of this cerebral control in adults is indicated by the vomiting that can occur in emotional states and in nervous excitable women.[2]

In animals either inhibition or stimulation of the intestinal nerve supply can be brought about by stimulation of different parts of the brain.

THE PHYSIOLOGY OF PERSISTENT VOMITING

Relaxation of the pyloric sphincter requires stimulation of the inhibitory fibers in the splanchnic nerves. Failure of sphincter relaxation probably results in the tumor of pyloric stenosis from a hypertrophy of the muscles proximal to the tight ring. Excessive afferent stimulating impulses from the unrelaxed pyloric sphincter in pylorospasm and pyloric stenosis are probably carried along the vagus and sympathetic nerve endings to the brain, where irritation of the "vomiting center" results. Further evidence of afferent nerve stimulation of this central center is presented in animal experiments, where the persistent vomiting of even a fatal peritonitis may be prevented by severing the nervous pathway by vagotomy and sympathectomy.[3] That the vomiting, even in cases of severe pyloric stenosis, is not mechanical alone is further evidenced by the finding at autopsy of a patent pyloric lumen.

TREATMENT FOR PERSISTENT VOMITING

In our treatment of pylorospasm and pyloric stenosis in artificially fed infants for the past year, following a suggestion of Sauer,[4] we have made it a routine practice to combine phenobarbital orally with the thick cereal feedings or the concentrated unsweetened evaporated milk formula. The control of projectile vomiting has not only been almost complete in pylorospasm, but fewer cases of pyloric stenosis have required surgery and the hypertonic infants have almost invariably become contented, quiet and relaxed.[5] We have yet to observe any evidence of phenobarbital poisoning, of cumulative effect of the drug, or of idiosyncrasy as manifested by skin eruptions. The results with phenobarbital in our cases are much more striking than when either type of formula is used alone, and are much more successful and safe than when the formula is combined with the former and now entirely supplanted addition of atropine.

Although not a consideration in this paper, it is proper to draw to your attention the relief that can often be obtained in severe colic of infants with the use of this same remedy. It is sufficient to remark that we have never before received such expressions of pleasure and gratitude from parents as we have experienced after the routine use of this same remedy for the relief of pain and sleeplessness in infants with colic.

The probable pharmocologic action of phenobarbital in relief of vomiting is most interesting. Relief of projectile vomiting in nervous, excitable women and in the vomiting of pregnancy from the administration of this remedy has already been observed and explained on the basis of lowering the excitability of the cerebral centers. Foreign writers have reported that the projectile "vomiting in association with pyloric stenosis is of a purely cerebral origin, for it can be warded off for several weeks by suitable hypnotics that produce a sort of continuous sleep."[6]

In animals of weak inhibition Pavlov has observed that such drugs as bromides do not act as sedatives but instead "simply regulate the activity of the nervous system by strengthening the intensity of the internal inhibition."[7] In small infants with persistent vomiting phenobarbital may relieve the condition by stimulating the weak intestinal inhibiting impulses so that the pylorus can relax, or by inhibiting the strong afferent stimulating impulses so that the "vomiting center" is not irritated. In colic, relief may be explained from the ability of this remedy to relax the spastic bowel by stimulating the nerve fibres of inhibition.

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[2] Alvarez, Walter C.: The Mechanics of the Digestive Tract. Chapter XXIII, 1929.

[3] Walton, F. E., Moore, R. M., and Graham, E. A.: The Nerve Pathways in the Vomiting of Peritonitis. Proc. Soc. Exper. Biol and Med. 27: 712, April, 1930.

[4] Sauer, L. W.: Dietary Treatment for Nonsurgical Pyloric Stenosis. Am. Jour. Dis. Child., 37:3. March, 1929.

[5] Barnett, E. J.: The Use of Phenobarbital in Infant Feeding. Arch Ped.: XLVII, 452-459. July, 1930.

[6] Foreign Letters: J. A. M. A., 93, 1988. Dec. 21, 1929.

[7] Editorial: J. A. M. A., 95: 415. August 9, 1930.

It is a common clinical observation that, if an infant with pylorospasm or pyloric stenosis can be carried along with medical treatment until he is about four months of age, the time when an infant's lack of inhibition usually disappears, the projectile vomiting often slowly or spontaneously leaves and specific dietetic management for its control becomes unnecessary. This same explanation and observation applies to colic, which is infrequently observed in an unspoiled infant after three or four months of age.

Phenobarbital apparently makes it possible for an infant with symptoms of vomiting or colic from lack of inhibition to obtain relief before he arrives at that age when his nervous system becomes stabilized. It is a common occurrence for parents to observe that the vomiting of colic returns or becomes aggravated when they prematurely stop or run out of their supply of phenobarbital, and that relief is again obtained as before just as soon as the remedy is resumed. It is unusual for us to see any need for the continued use of this remedy in this condition after an infant is three or four months of age.

Phenobarbital is available in one-fourth grain tablets. It is our practice to give a half of one crushed tablet either before or in each milk feeding. In some instances an entire tablet is required. With relief from symptoms the remedy may be administered with every other feeding and then reduced to twice a day and then stopped. On any return of symptoms the original dosage may be resumed. Prompt surgery for relief of pyloric stenosis is indicated, if persistent vomiting and failure to gain in weight continue in spite of the addition of this remedy to either the unsweetened evaporated milk or thick cereal feeding.

Unsweetened evaporated milk is so concentrated that it has a thickening effect in the infant's stomach and the fine gelatinous protein curds pass through the pylorus with greater ease than other types of milk formula. Thick cereal feeding seems to be the only type of formula that most physicians in general practice are hesitant in prescribing and yet it is easy in preparation and most valuable in relief of vomiting from pyloric obstruction. It is difficult for the infant's stomach to expel all of this thick, heavy, sticky mixture and as a result at least some of it has a tendency to remain in the stomach and then pass on to the bowel, whenever the pylorus intermittently relaxes.

Thick cereal feedings simply require the addition of enough farina (usually three or four rounded tablespoonsful) to thicken the entire day's formula of whole milk dilution, when the entire mixture is cooked in a double boiler for one hour. The cooked mixture should be thick and solid as any cooled, cooked cereal and each individual feeding, when warmed, should require a nipple hole almost as large as the unsharpened end of a lead pencil.

In certain instances, such as combined cardiospasm and pyloric stenosis, the persistent vomiting may be so immediate and complete that there is no opportunity for absorption of phenobarbital. In these instances, until the vomiting is relieved, we have temporarily resorted to the hypodermic use of sodium-luminal.

Weiss[8] has emphasized that all the barbital derivatives exert their effects most markedly when the patient is kept in quiet surroundings away from nervous excitement. Physicians must insist that infants with the vomiting of pyloric obstruction or the pain of colic are to be kept in a quiet room alone and not handled unnecessarily. If the cooperation is not obtained, the use of phenobarbital is ineffective and hospital care is required.

SUMMARY

1. The persistent vomiting of pylorospasm or pyloric stenosis results from a neuromuscular incoordination.

2. Phenobarbital, when combined with proper diet, is an efficient and often a specific remedy in relieving vomiting of pylorospasm. Fewer cases of pyloric stenosis require surgery when it is used.

3. Phenobarbital exerts its effect on the nervous system. The pylorus and bowel are relaxed and impulses to the "vomiting center" are diminished.

4. Striking relief may follow its use in colic.

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[8] Weiss, Soma: The Therapentic Indications of the Dangers of the Intravenous Administration of Sodium Phenyl-Ethyl Barbitrate (Sodium Luminal) and Other Barbituric Acid Derivatives. Am. Jour. Med. Sc. CLXXVIII: 3, Sept., 1929.

Intrinsic Carbohydrate Metabolism of Skin. In a preliminary report of experimental studies, Donald M. Pillsbury, Philadelphia (*Journal A. M. A.*, Feb. 7, 1931), states that lactic acid, an important product of carbohydrate metabolism, is normally present in the skin. Lactic acid formation in vitro is a consistently demonstrable finding in normal skin, except when the skin has been previously frozen. Decreased oxygen tension has no significant effect on in vitro lactic acid formation by the skin. In the presence of dextrose in the incubating medium, especially in phosphate buffer solution, lactic acid formation is increased. The skin of animals previously injected with dextrose forms lactic acid in vitro in larger amounts.

SPOROTRICHOSIS ON THE PACIFIC COAST[*]

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Although sporotrichosis is a comparatively common disease in some portions of the United States, particularly the Mississippi Valley, it is quite rare on the Pacific Coast. To the best of our knowledge only three cases from the western coast states have been recorded in the literature. Two of these[1, 2] were definitely proved by the isolation of the organism but in the third case[3] the sporothrix could not be found, although the clinical signs were typical.

Sporotrichosis is the disease which results from the infection of man or animals by the sporotrichum schenkii-beurmanii. This organism is a fungus belonging to the hypomycetes which leads a saprophytic existence upon many things in nature. It has been found on bushes, trees, plants, straws, leaves, decaying logs, in freshly plowed ground and in manure. Foerster[4] has reported a number of infections resulting from thorn pricks from the barberry bush. These occurred in gardeners and nurserymen and hence were of importance to the industrial physician and insurance companies.

It is important to bear Foerster's work in mind in view of the widespread use of the barberry bush in the western states. Instances have been recorded in France of cases having arisen in patients who had been given intramuscular injections of sulpharasphenamine or who had received various intradermal tests. The belief was that the organisms had been carried into the skin by these measures.

The sporotrichum responsible for the disease in man was first described by Schenk in 1898. Since then about one hundred and seventy cases have been reported in the American literature. Shortly afterwards Beurman reported cases from France. He and his coworkers studied the fungus and believed that seven or eight subvarieties existed. Thus we have the S. schenkii, the S. beurmanii, etc. Meyer and Aird[5] have studied the carbohydrate fermenting power of the various strains and have concluded that "the American strains of pathogenic sporotricha are best classified as one species, "sporothrix schenkii-beurmanii."

It is not within the province of this paper to enter into a detailed discussion of the mycology of this organism. Suffice it to say that it belongs to the general order of hyphomycetes and to the suborder of rhinocladium. Under anaerobic conditions in lesions in vivo it occurs as yeast-like bodies, varying in size from that of a coccus to that of an erythrocyte. Under aerobic conditions in cultures it exists as long, branching septate mycelial threads with spores which are single or grouped in grapelike bunches at the ends of the mycelia or at the ends of lateral offshoots (conidia). Chlamydospores occur occasionally in old cultures. The spores are about the size of an erythrocyte and tend to be somewhat elongated rather than round, pear or grain of wheat shaped. Inasmuch as the spores are easily detached, many are often seen to be lying free from the mycelia. A similar existence of different life cycles in vivo and vitro is seen in a study of the coccidioides immitis.

It is difficult to demonstrate the organisms by direct examination of pus from a discharging sinus but, if a previously unopened nodule is incised, the tiny yeast-like spores may be found. Lawless[6] has shown that the direct examination of suspected pus for the sporotricha may be facilitated by mixing it with dextrose or maltose solution, making a hanging drop preparation and examining after several hours. This enables the organisms to develop and to be more readily found. An oil immersion lens should be used. The fungus can be easily cultivated from the contents of such a nodule. It grows readily on Sabouraud's maltose-peptone-agar at room temperatures.

The growth is first noted about the third to the seventh day and appears as a fuzzy white colony. As it becomes older the color of the colonies changes to grey or coffee brown and finally to black. A classic old culture should be black but variations occur on various culture media which cause the colony to remain white or to become grey or brown. When examining the growth microscopically it is well, according to Weidman,[7] to remove a portion of the agar with the specimen. Otherwise the spores may be shaken off the mycelial threads and the characteristic picture spoiled.

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[*] From the Ernest V. Cowell Memorial Hospital, University of California.

[1] Burlew, J. M.: Subcutaneous Abscess Caused by the Sporotrichum Schenkii. S. Calif. Pract., Vol. XXIV, No. 1.

[2] Mason, V. R. and Frost, K. P.: Report of a Case of Sporotrichosis. Calif. State Jour. of Med., Vol. XXI, No. 1, p. 381.

[3] Gallegos, P. B.: Cutaneous Sporotrichosis. Calif. and West. Med., Vol. XXVI, No. 6, p. 802.

[4] Foerster, H. R.: Sporotrichosis, An Occupational Dermatosis. J. A. M. A., 87:30, p. 1605.

[5] Meyer, K. F. and Aird, J.: Various Sporotricha Differentiated by the Fermentation of Carbohydrates. Jour. Infect. Dis., XV, p. 399, 1915.

[6] Lawless, T. K.: The Diagnosis of Sporotrichosis. Arch. Derm. and Syph., Vol. XXII, No. 3, p. 381, 1930.

[7] Weidman, Fred.: Discussion of Case Presented by Dr. Schamberg. Phila. Derm. Soc. Arch. Derm. and Syph., Vol. XV, p. 726.

The disease may be produced experimentally by injecting animals with cultures or with material aspirated from a nodule. The white rat is the most susceptible animal and responds by the development of a nodule at the site of inoculation or an orchitis after intraperitoneal inoculation.

Serum from a recently infected patient or animal will react positively to complement fixation and agglutination tests, when an antigen prepared from the sporothrix is used. That a state of allergy is produced is evidenced by Meyer's report of a positive reaction to an intradermal injection of the specific antigen. This reaction became negative six months later.

CLINICAL TYPES OF SPOROTRICHOSIS

Lymphangitic Type. This is the most common type of the disease seen in the United States. The usual history is that the hand or finger has been injured by some object which has been contaminated by soil. As mentioned previously, seventeen of Foerster's cases began following injury by thorns of the barberry bush. In about six to twelve days after the injury an erosion or ulceration occurs at the site of the inoculation. This is called the "sporotrichotic chancre." Within a week or ten days split-pea to hazelnut size firm intradermal or subcutaneous nodules develop proximally along the lymphatics draining the area. These nodules are quite firm and are peculiarly painless. They may remain stationary or may be absorbed. More rarely they soften and break through the skin. The lymphatics along which the nodules occur may develop a low grade lymphangitis without, however, the tenderness and redness which usually accompany lymph vessel inflammation. On the other hand, the lymph vessels connecting the nodules may show no signs of involvement. The regional lymph nodes such as the cubital, axillary and femoral, usually become swollen. If the disease is not recognized, this process may last for months or years, new nodules frequently appearing.

It is necessary to differentiate this type of sporotrichosis from septic lymphangitis, primary syphilis and, especially in California, from tularemia. The indolence of the process, the absence of pain, tenderness and other signs of acute inflammation serve to differentiate it clinically from septic lymphangitis. But no diagnosis can be considered as established until the sporothrix has been isolated by one of the laboratory methods mentioned previously. A syphilitic chancre with regional adenitis may simulate sporotrichosis; but here again the laboratory must be depended upon for the final diagnosis which will require the use of cultures, the Wassermann reaction and dark field examinations for the spirocheta pallida.

Tularemia may show a "chancre" at the site of inoculation, lymphangitis and regional adenopathy but the whole process is very much more acute than sporotrichosis. The initial lesion, lymphatics and glands show far more evidence of acute inflammation; the patient may be quite ill and have a marked fever which is not seen in sporotrichosis. The final diagnosis rests upon the discovery of a positive agglutination test for the B. tularense or a culture of the sporothrix.

The Disseminated Nodular Type. This type is characterized by split-pea to walnut sized nodules and tumors which occur in the skin and subcutaneous tissues. Their number may vary from a few lesions located here and there on the body to a great many. They do not occur in systematic groups along the lymphatics but are scattered about with no regular arrangements. Very little pain is produced by them, nor are they very tender on pressure. At first they are quite firm but as they become older they may soften and fluctuate. If they break down, sinuses form and enlarge to form ulcers, whreupon the type may have said to have passed into the ulcerated stage.

The Disseminated Ulcerated Type. This, then, is merely the later ulcerated stage of the sporotrichotic nodules or tumors. The ulcers may vary in size from small openings of sinuses to huge palm-size, deeply destructive lesions.

Both the nodular and ulcerative types must be differentiated from syphilis and tuberculosis. Although there are certain clinical differences, in the last analysis it will have to be the laboratory findings that will determine the diagnosis. In searching for the sporothrix in these disseminated cases it is particularly important to aspirate an unopened nodule, inasmuch as it is much more difficult to isolate the organism from pus from a sinus or an ulcer.

These types should be differentiated from coccidioidal granuloma because of the prevalence of this latter disease in California. This can be done either by direct microscópic examination of the pus or by culture. Although the organisms of both diseases exist as spores in vivo, these differ in several particulars. The most important difference is that the coccidioides immitis reproduces by endosporulation, which feature is not seen in the case of the sporotrichum. Cultures of the coccidioides immitis upon

Sabouraud's medium are always white, whereas those of the sporotrichum are generally dark in color.

The Visceral Type. The sporotrichum occasionally attacks the various viscera. Involvement of the bones and joints has been frequently recorded. Likewise, the liver, lungs and spleen may be infected. Even sporotrichotic meningitis has been reported. All of these must be differentiated from syphilis, tuberculosis, coccidioidal granuloma and other infections by means of laboratory findings.

PATHOLOGY

The pathology in general is that of a chronic infective granuloma of the tuberculoid type with some features in common with those of syphilis, tuberculosis and other deep hypomycetic infections, especially coccidioidal granuloma.

As the characteristic histopathology is seen best in the hypodermic nodules of the lymphatic type of the disease, such changes will be described here. The changes found in our patient were almost identical with those recorded by other observers, therefore we will write as from our own experience.

Epidermis. The epidermis is normal. This is the usual finding in a nodule which has not broken down. Later, after the nodule has ulcerated, the epidermis is destroyed.

Corium. The pars papillaris and pars subpapillaris are almost normal except for a very slight infiltration around the vessels, consisting of round and epithelioid cells. The main changes are seen in the pars reticularis and extend entirely to the subcutaneous fat layer. Here there is an almost solid sheet of cells, the whole mass being fairly sharply demarcated from the normal skin. The connective tissue reticulum of the skin and the blood vessels are retained, showing that the whole process is an infiltrative one. Besides the remaining old vessels, many newly formed blood vessels can be seen. The cells composing the infiltrate are lymphocytes, many plasma cells, many epithelioid cells and a fair number of giant cells, forming microabscesses. In fluctuating nodules the center is formed by the enlargement of one, or of the coalescence of several such microabscesses. The spores of the sporotrichum can occasionally be seen.

Although the giant cells and epithelioid cells are somewhat suggestive of tuberculosis, there is no definite arrangement of these cells into true tubercles. Moreover, plasma cells are found here, whereas they are not seen in tuberculosis of the skin, nor are blood vessels found in the center of a true tubercle.

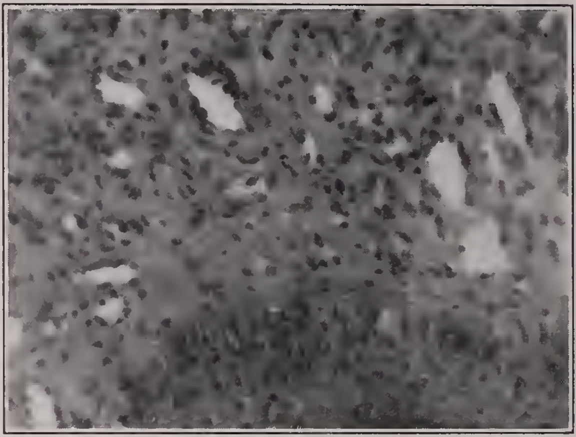

Fig. 1. Section from primary nodule, showing histopathology of granuloma pyogenicum.

The picture differs from that of syphilis in its polymorphicity, its lack of the typical "coat-sleeve" perivascular infiltrate seen in syphilis, and the presence of microabscesses which are not common in syphilis.

From coccidioidal granuloma the process differs but little. In fact, we have seen exactly the same picture painted by this other "California disease" and have been unable to differentiate the two on histopathologic evidence alone.

PATHOLOGY OF INITIAL LESION

In the case of the patient whose history we are reviewing below, the attending physician removed the initial lesions on the finger about two months after the onset and subjected it to microscopic examination. Clinically this initial lesion or "sporotrichotic chancre" was a pyogenic granuloma. The microscopic picture agreed in every detail with this diagnosis (fig. 1). The picture was that of a cross section of a highly vascular tumor completely surrounded by epidermis. The epidermis showed a moderate intercellular edema. The tumor itself was formed almost exclusively of swollen, rapidly growing fibroblasts. It was highly vascular, there being very many newly formed capillaries and larger endothelioid lined vascular spaces. Erythrocytes filled some of these newly formed vessels. A few lymphocytes and polymorphonuclear neutrophylic leucocytes were seen. There were no giant cells or plasma cells.

TREATMENT

Iodides are practically specific for the disorder. Beginning with ten drops of the saturated solution of potassium iodide three times daily, the dose should be rapidly increased until one or even two drachms of this solution are bieng given at each

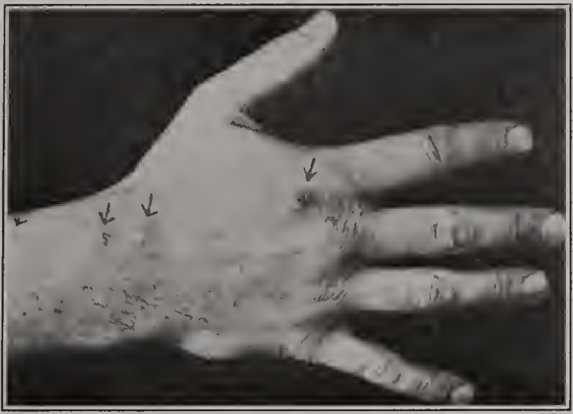

Fig. 2. Sporotrichosis, lymphangitic type, showing nodules along lymphatics.

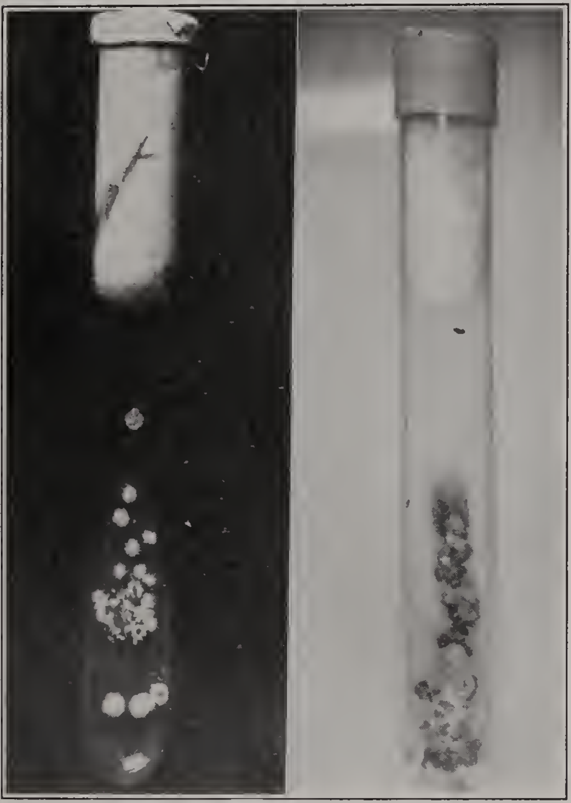

Fig. 3 Fig. 4

Fig. 3. Two weeks old culture of the sporotrichum on Sabouraud's medium.

Fig. 4. Two months old culture of the sporotrichum on Sabouraud's medium.

dose. Sodium iodide in ten per cent solution has been given intravenously, but this is rarely necessary as the improvement with oral administration is quite rapid. Most cases recover in from one to three months time. It is safer to continue medication for one month following complete recovery in order to avoid relapses. Filtered roentgen-ray treatment of the individual nodules will hasten their disappearance but is rarely necessary.

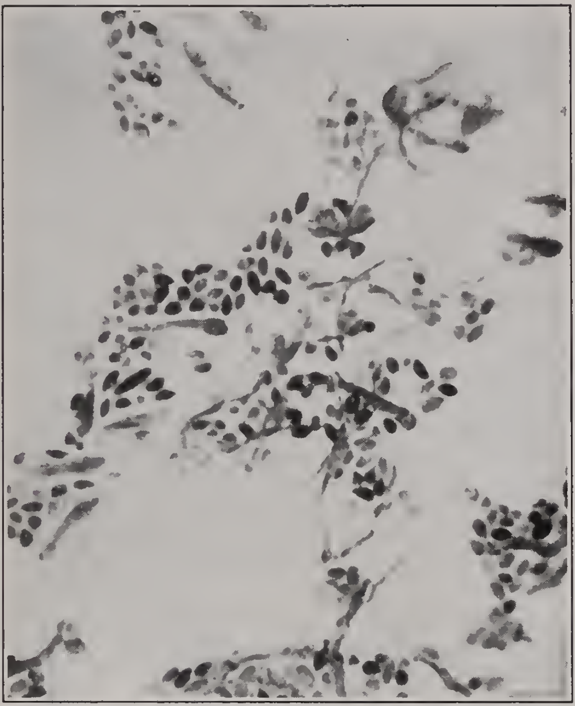

Fig. 5. Mycelia and spores from the culture shown in fig. 3. Many of spores have been shaken free from the mycelia.

CASE HISTORY

About September 1, 1929, A. T., age 34, an instructor at the University of California, noticed a very small "sore" on the right finger. He could not remember having injured the finger. He had worked with rose bushes but not with barberry bushes. The lesion was so trivial that he paid very little attention to it. It persisted and very slowly increased in size.

Early in November he consulted a San Francisco physician who found a clinically typical granuloma pyogenicum about the size of a pea. He removed the growth and had it sectioned. His diagnosis was confirmed by finding the typical histopathology of granuloma pyogenicum (fig. 1). This initial lesion healed, but in the next three months five nodules slowly developed on the dorsum of the hand and arm (fig. 2). The first one was in the interdigital space between the second and third fingers. It was about the size of a large pea and was located in the skin. Although it was quite firm, there was a suggestion of central fluctuation. About three-fourths of an inch proximal to it was another similar lesion. Three more could be felt better than seen in the lymphatics draining the area. These vessels did not present the hard cord-like lymphangitis described in other cases. The nodules were neither tender nor painful. There was no fever or malaise at any time in the illness.

The nodule between the two fingers was excised and found to be in the skin. When it was split in half, the center was found to be liquified. Smears taken from the seropurulent liquid did not disclose the sporotrichum. Unfortunately we were not familiar with Lawless' method of examination at that time. Sabouraud's medium was inoculated and a growth was visible after one wek. At first the colonies were white as shown in fig. 3. These same colonies gradually darkened and became almost black in two months (fig. 4). These colonies were found to consist

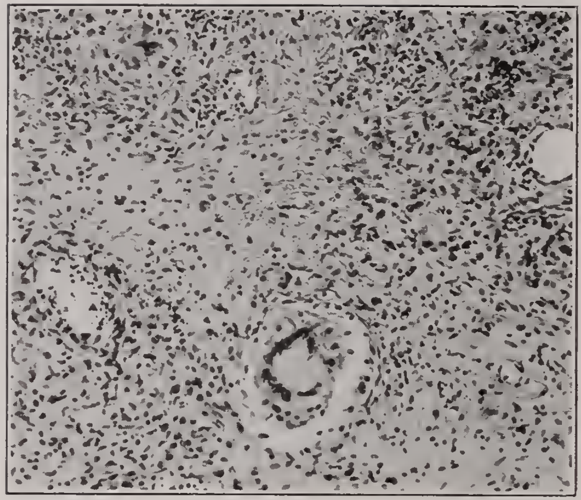

Fig. 6. Section taken from a secondary nodule, showing microabscesses and character of cells, especially polynuclears, epithelioid, round and giant cells.

of the mycelial threads and spores of sporotrichum (fig. 5). A guinea pig was inoculated intraperitoneally and showed no pathology upon autopsy two months later. A mouse was inoculated and was found to be infected when examined about the same time.

Half of the nodule was prepared for microscopic study. The findings have been mentioed above (fig. 6). No complement fixation or agglutination tests were done. No sporotrichin was available for intradermal testing until September, 1930, one year after the onset of the disease. At that time such a test was negative. It is to be noted that Meyers reported that his test, which had originally been positive, became negative after six months. The sporotrichin which we used was kindly furnished us by Dr. Albert Weidman of Vienna. The patient was placed on large doses of iodides by mouth and filtered roentgen-ray was given the individual nodules. Recovery was rapid.

SUMMARY

Sporotrichosis is rare on the Pacific Coast. A case is presented with clinical and laboratory findings. The differential diagnosis is considered and it is pointed out that in California, at least, tularemia and coccidioidal granuloma must be added to the list of diseases from which it must be differentiated.

The histopathology of the secondary nodules in our case was that usually seen in sporotrichosis but that of the initial lesion was the typical picture of granuloma pyogenicum.

Acute Transient Epiphysitis of Hip Joint. Acute transient epiphysitis is given by O. L. Miller, Charlotte, N. C. (*Journal A. M. A.*, Feb. 21, 1931), as a common cause of hip complaint in children. It is usually provoked by mild trauma. It may be suspected in a child complaining of pain about the hip if he has diseased tonsils or has recently had an acute infectious disease. Eighty per cent of his cases were associated with diseased tonsils. Carefully made roentgenograms will show small abscess formation and absorption about the epiphyseal line.

LOCAL ANESTHESIA AS A ROUTINE IN MASTOID SURGERY

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The writer has recently returned from a year's study of mastoid and ear surgery abroad, and during his sojourn there was deeply impressed by the vast number of mastoidectomies routinely performed under local anesthesia in certain sections of Europe. When the ease with which mastoidectomies are thus performed, the simple rationale underlying the administration of the local anesthetic, the numerous advantages in its use are all considered, it seems that the surprise and apathy exhibited by colleagues in this specialty in the northwest sector of the country are unwarranted, when local anesthesia as a routine in mastoid surgery is brought to the fore. The appearance of an article by Koster and Wolf[1] would tend to show that the apathy to local anesthesia in mastoid surgery is by no means confined to this section. For these reasons the writer proposes to examine the subject, to cite the method of administration and its rationale, to speak in analogy of the anatomy of the structures under consideration in mastoid surgery, to mention the advantages and the disadvantages in the use of this method.

The writer at this point wishes to deviate somewhat from the order of the above enumeration, and begin with a brief consideration of the anatomic structures dealt with in mastoid surgery. Disregarding for purpose of analogy the pneumatic subdivisions of the mastoid cavity and the slight spacial constriction in the region of the antrum (the mastoid cavity, the antrum, the middle ear with its epi- and hypotympanic spaces, and the eustachian tube), all of these combined may be considered as an irregularly pyriform-shaped cavity, open at the base of the stem which is the pharyngeal ostium of the eustachian tube. This cavity is lined inside by a layer of endothelial cells continuous with those lining the eustachian tube. Throughout its course this endothelial lining is thin and adherent to its bony understructure, excepting in places where it is reflected to cover the ossicles and act as sheaths for the muscles and nerves coursing through the tympanic cavity, with the formation of recesses and pouches incidental to such flexures. Enclosing this cavity in its accessible regions, are in the mastoid area, skin, fascia, muscle, periosteum and bone with their nerves and vessels, and in the tympanic region, the tympanic membrane, consisting of a thin layer of modified skin, the substantia propria, consisting largely of radial connective tissue fibres, certain vessels and nerves, and parts of the malleus, incus and tensor tympani muscle. The normal contents of this cavity, though they can not be considered as true contents because as mentioned above the endothelial lining is reflected to cover them largely, are the ossicles, i.e., the malleus, incus and stapes, their ligaments and ligamentous folds, the tensor tympani and stapedius muscles, the vessels and nerves of the tympanic cavity, and the bony cells in the mastoid cavity. In anomalous cases of bony dehiscences in various parts of the cavity, certain other structures, depending on the location of the dehiscences, must be considered as additional contents of this cavity. Summarily speaking, then, we have here for the largest part a continuous bony cavity, lined by endothelium within, and covered by ordinary integumentary structures on the accessible outside.

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[1] Koster and Wolf: Spinal Anesthesia in Mastoid Surgery. Arch. Otolaryng., Vol. 12, No. 5, page 591. November, 1930.

Following the above anatomic scheme, what is there that should deter us from routinely (except in the very young) operating on our mastoids under local anesthesia? The soft tissues down to the bone, including the periosteum, can be easily anesthetized; the tympanic cavity and the external auditory canal can also be easily rendered anesthetic; the bone itself, with periosteum and endosteum already anesthetic, is naturally anesthetized. Where is the barrier?

Sharpe[2] states that in his clinic he operates on the gasserian ganglion under local anesthesia. The operator gets through the bony skull by means of integumentary anesthesia only. In the mastoid system we have the advantage of being able to reach the tympanic cavity and antrum with local anesthesia prior to operation by a procedure to be spoken of later in this paper, rendering possible even a larger index of anesthesia than is present or could be obtained through integumentary anesthesia only. Yet Sharpe operates on the gasserian ganglion under local anesthesia as a routine, while mastoid surgeons remain shy of doing so.

The above factors in the opinion of the writer representing a sound rationale, he has been practicing mastoid surgery under local anesthesia as a routine with results which rival those obtained from operations under general anesthesia. Most operators, for fear of perforating the thin tegmina antri and tympani in an unconscious patient (these rather fragile barriers to the middle cranial fossa which offer least resistance to cholestheatomata and bone-affected middle ear infections), are apt to be too conservative in cleaning out granulations and cholestheatomata in those regions. Under local anesthesia the consciousness of the patient is the guide to the amount of radical surgery in these regions. Break the tegmina, and the patient will break out with vocal objections, notifying you of meningeal pressure.

TECHNIC OF THE ANESTHESIA ADMINISTRATION

The writer has modified the technic as it is practiced in European clinics, and will here present that as employed by him at the Western Clinic in Tacoma. The patient is seen at the office four hours prior to operation. At this time the external canal is thoroughly cleansed of all secretions and crusts, as far into the tympanic cavity as the patient will permit. The canal, the tympanic remains and as far as practicable the tympanic cavity are then dried by means of air insufflation with a Hartman canula attached to an atomizing bulb. Then drop two drops of a solution containing 50 per cent cocaine, 25 per cent phenol and 25 per cent glycerin on the tympanic remains, and have patient lie on unaffected side for five minutes, in order to permit the solution to penetrate into the tympanic cavity through the tympanic perforations. At the end of five minutes drop two more drops of this solution on the tympanic remains, saturate a strip of gauze, a quarter inch wide by about four inches long, with this same solution, and pack it loosely into the external canal, beginning by apposing it to the drum and thence through the extent of the canal. In a canal of wider diameter a longer strip of gauze is necessary. Then plug the canal at the external meatus with a sterile cotton plug in order to minimize chances for evaporation. Vaselined cotton has a greater sealing index, and is therefore used to plug the canal. A hypodermic injection of one-quarter grain of morphine sulphate and one one hundred and fiftieth grain of atrophine sulphate a half hour preoperatively is desirable, though not essential.

The patient, with the operative area properly shaved, is placed in the lateroprone position on the unaffected side, and is afforded as much decubital comfort in that position as he requests. The usual preoperative aseptic and antiseptic mastoid preparation is followed. The operative area and an area for a considerable distance beyond this are then sterilely draped. This draping, however, is temporary, and need not cover the entire body, as a complete redraping is necessary, following the injection of the anesthetic.

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[2] Sharp, Norman: Neuro-Surgery. Principles, Diagnosis and Treatment. J. B. Lippincott Company, page 535. 1928.

The anesthetic is injected as follows. The armamentarium consists of a 10 cc. pressure syringe (the writer prefers a B.D.), an ordinary 20 gage hypodermic needle, two fourteen gage needles of pliable material six to seven cm. long, two sixteen gage needles of the same length and of equally flexible material, two ounces of a one-half per cent novocaine adrenalin or procaine adrenalin solution, and an ordinary assortment of mastoid instruments. The ensuing steps are followed.

First step. Using the hypodermic needle, inject the skin one-half inch behind the auricle, slightly above the level of the tragus, to form a wheal of twenty mm. diameter. One-half to one cc. of the solution is sufficient to raise this wheal. This needle is then withdrawn, and one of the fourteen gage needles is locked to the syringe.

Second step. The auricle is drawn slightly forward by an assistant, and the operator inserts the needle at an angle of ninety degrees into the skin, directly at the auriculomastoidal angle, at the level of the middle of the external auditory meatus. With the auricle drawn forward as stated above, the wheal will be found to cover this part of the auriculomastoidal angle. The needle is then pushed for a depth of twenty-five mm., sliding it along the posterior bony wall of the external auditory canal. With the needle in this position inject three cc. of the novocaine or procaine solution, observing carefully the external canal while so doing. If the solution is entering the right place, i.e., the periosteal layer of the posterior wall of the canal, the entire integumentary soft structure of the posterior wall of the canal will be seen to bulge and approximate the anterior wall.

Third step. Using the original wheal as a starting point, the needle is inserted at an angle of forty degrees, and is pushed through the soft tissues down to the bony layer, and the solution is injected subperiosteally in all directions, up and down the mastoid region and adjacent bony table of the skull for as much area as the operator will wish to expose. The needle need not be withdrawn, as the direction may be changed with it in situ. The periosteum will be "felt" to lift under the pressure of the advancing solution. If the needle bends or breaks under the pressure, remove it and attach one of the other needles of approximate gage and length.

Fourth step. The needle is then drawn up to the level of the skin, and this anesthetized along the line of proposed incision. A linear skin injection is usually sufficient, particularly if the operator intends to carry the original incision through all the soft tissues down to the bone.

Fifth step. At this time five minutes patience on the part of the operator will reward him with a painless, bloodless field to work in ad lib. These few minutes are utilized to redrape the patient completely. Then the gauze strip that was inserted into the external auditory canal four hours preoperatively is removed by the nurse by means of a sterile bayonet forceps.

The patient is now ready for operation. The usual procedure is followed, using a wooden mallet instead of a metallic one. The operative technic is no part of this paper. The writer, however, wishes to emphasize two points of the technic used by him that are of particular advantage in this method. The first is to send the original incision right down to the bone, and the second that the antrum be thoroughly exposed before eventration of the surrounding mastoid cells. The latter is particularly desirable in cases where the operator suspects cholestheatomata and granulations to be abundant in the attic and antrum regions. In such cases, upon exposure of the antrum the operator may reinforce the original anesthesia by inserting into the antrum and middle ear a strip of gauze, saturated with a solution containing cocaine 50 per cent, phenol 5 per cent and glycerine 25 per cent. While the operator is cleaning out the remaining mastoid cells, this strip further anesthetizes the antroatticotympanic regions. In ordinary cases this additional anesthesia is not necessary.

The cooperation of the patient will be found complete. In the case of one patient, O. C., operated on at St. Joseph Hospital on August 9, he hummed and whistled popular tunes throughout the operation. It is quite gratifying to hear patients whistle during a mastoidectomy for reasons superfluous to mention here.

The writer has performed twenty-one mastoidectomies under local anesthesia in a period of sixteen months, on patients varying in age from a girl of thirteen to a man aged seventy-three. The last case was operated on by the writer while in Checho-slovakia. The patient maintained such a state of silence during the operation that one of the assistants jocundly suggested he was already in true cadaveric state. With that suggestion he nudged the patient, and received the answer that he was alright, and was not suffering any pain.

Four of the twenty-one cases were for acute mastoiditis, while the remaining seventeen were for chronic suppurations, ranging in duration from two to sixteen years. All of the cases were followed up and in only one patient, a male aged fifty-seven, with a chronic suppuration of eight years' duration, did the discharge continue when last seen, six months postoperative.

The patients generally leave the hospital on the fifth day. One, C. B., operated on at St. Joseph Hospital October 28 for a chronic mastoiditis with cholestheatoma of seven years duration, developed an induced serous labyrinthitis on third day after the operation, but he was able to leave the hospital on the ninth day at his own request. Intracranial complications, such as extradural abscesses, temporal lobe abscesses and sinus thromboses, offer no difficulty. When it is found necessary to ligate the jugular vein in a case of sinus thrombosis, the route for ligation may be anesthetized after inspection of the sinus has proved its necessity.

It may now be apropos to search this rationale for advantages other than the usual ones of a local anesthetic over a general, and also to search for disadvantages.

Advantages. 1. It is an old established fact that certain chronic, cachectic, myocardial and hypertension diseases do not without risk permit the submission of the subject they afflict to a general anesthetic. Here is the ideal solution, when mastoid surgery is imperative in such cases.

2. In patients where there is already present a sagging of the posterosuperior wall of the canal, and bone destruction adjacent to the facial nerve is suspected, the index of safety in keeping from traumatizing the facial nerve is much increased, when the consciousness of the patient has not been suspended.

3. In cases when it is found necessary to open the labyrinth, the consciousness of the patient also helps us as guide to traumatism of the facial nerve. In cases of labyrinthitis complicating matters, the patient is already having symptoms of labyrinthian irritation or death, and the opening of the labyrinth under local anesthesia gives little if any additional momentary irritation symptoms.

4. Hemostasis is better controlled.

5. The tegmina tympani and antri, both very fragile guards of the middle cranial fossa, are less apt to be injured in a conscious patient.

6. A considerable number of patients in some elements of our population, while ready to submit to operative procedure under local anesthesia, regarding such lightly, positively refuse to be "put to sleep."

Disadvantages. The writer must state that in his experience thus far he has not encountered any. A hypernervous state would seem to contraindicate the use of local anesthesia, and indeed the writer was of this opinion until four months ago, when he operated on a male patient, aged thirty-nine, who had been previously diagnosed to be suffering from dementia precox. The patient was seen two days prior to the writing of this paper, and then still complained of mental symptoms, of noises issuing from him which annoyed others in his immediate vicinity, according to his statements. His ear, however, was not suppurating.

LOCAL VERSUS SPINAL ANESTHESIA IN MASTOID SURGERY

The writer has had no experience in mastoid surgery under spinal anesthesia. Koster and Wolf,[3] state, "We are cognizant of the fact that there have been deaths directly attributable to spinal anesthesia," and continue by rationalizing the causation of these deaths from sound physiologic standpoints. Be the explanation what it may, the method of anesthetizing practically the whole body per viam spinalis is by no means wholly safe as yet. When the procedure attains a point where it may be used with a total absence of mortality or even fear thereof, it will still be in the opinion of the writer, when compared to the use of local anesthesia, analagous to cutting down a whole forest to obtain one twig, when this twig is in plain view and to be obtained without disturbing the rest of the forest.

In conclusion, local anesthesia in mastoid surgery has the same rationale as that generally used in surgery of other parts. From the advantages above enumerated, it may be routinely used with safety and with preference to general anesthesia.

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[3] Koster and Wolf: Loc. cit., page 596.

TROPICAL RAT MITE, LIPONYSSUS BACOTI HIRST, 1914. Approximately 200 cases of "rat mite dermatitis" are reported by Bedford Shelmire, Dallas, Texas, and Walter E. Dove, Charleston, S. C. (*Journal A. M. A.*, Feb. 21, 1931), from Dallas, Texas, and neighboring towns. From persons having evidence of mite bites, and from the residences or places of work of such persons, mites were collected and identified as *Liponyssus bacoti* Hirst. At Dallas, Fort Worth, Henderson and Longview, Texas, mites were collected from rats and were identified as *Liponyssus bacoti.* At Dallas, Forth Worth, Henderson and Longview, 11 proved cases and approximately 125 cases of suspected endemic typhus are reported.

HYPERTHYROIDISM

PRACTICAL POINTS IN ITS PHYSIOLOGY*

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This is not offered as a comprehensive survey of the subject, but it presents a few points which have had a more or less practical interest to me and which I hope will not be out of place. In order to keep the paper practical, I shall not discuss the foggy depths of the chemistry of thyroxin or associated subjects. I shall confine my remarks to seven main points.

1. A FORMULA FOR THE ROUGH DETERMINATION OF THE BASAL METABOLIC RATE IN THE OFFICE

The increased heat production of hyperthyroidism must be neutralized by increased heat elimination. Increased flow of blood from the deeper structures to the skin is essential for heat loss through radiation. Indeed, this may be so marked as actually to produce an erythema, which is one of the signs of impending crisis. The increased flow of blood is proportional to the increased basal metabolic rate.

Read,[1] in 1922, produced a formula for determining the basal metabolic rate, based on the increased pulse rate and pulse pressure. He took nine-tenths of the pulse pressure, added it to the pulse rate, multiplied by 0.683. From this result he subtracted 71.5 to get the basal metabolic rate. This formula is not very accurate because it is subject to error from any cause that will increase the pulse rate, such as organic heart disease or nervousness and from anything that will elevate the blood pressure, such as arteriosclerosis. Therefore, he does not use it with patients who have a blood pressure of over 160.

In 1922, while a senior medical student, I made sixty-seven comparisons between this formula and the basal metabolic rate. Like other observers, I found 40 per cent of the cases gave an error of over 10 per cent. In the big majority of error cases the formula gave a higher reading; in the remaining few the formula as well as the basal metabolic test showed hyperthyroidism. At no time did the formula give a normal reading and the basal metabolic test show hyperthyroidism.

My experience was too limited for final conclusions, but we must admit we have received quickly and inexpensively a strong hint of the type of case before us. For example, if a patient had a blood pressure of 90 over 120, we would have a pulse pressure of 30. Nine-tenths of this is 27, to which we add the pulse rate, say 80, giving us 107. Multiplying by 0.683, we get 72. Subtracting 71.5 from 72, we have a rate of essentially zero. Of course, we might know from other sources that such a patient does not have hyperthyroidism, but in spite of its obvious errors the formula has been a source of satisfaction to me.

2. GENERAL INFECTIONS AND TOXEMIAS

Marine and Lenhart,[2] in 1909, showed that iodine deficiency produces a thyroid gland with epithelial hyperplasia and loss of iodine content that makes the gland microscopically and chemically similar to that of exophthalmic goiter. These glands become colloid upon recovery. Cole and Womack,[3] at St. Louis, found infections elsewhere in the body produced essentially the same changes in the thyroid that Marine found could be produced by lack of iodine.

They also found[4] that in fulminating infections there is a lowering of the basal metabolic rate; in less severe infections, an initial drop, followed by a rise; in mild infections a rise with no initial drop. Giving iodine or thyroid extract prevents hyperplasia and saves the colloid in the gland, thus keeping it closer to normal, and tends to keep the basal metabolic rate normal. In infections thyroid extract or iodine lessens both the initial fall and also the rise of the basal metabolic rate. Iodine does this to a greater extent than thyroid extract. In experimental peritonitis a dog had its appendix ligated and died in thirty hours. Two other dogs had their appendices ligated. One was fed iodine, the other thyroid extract. Both lived for over fifty hours.

Carrying their work further, Cole and Womack[5,6] came to the conclusion that human thyroids underwent the same reaction to infections as those of canines, although the reaction is not so marked. In spite of their work, they still hesitate to advise iodine therapy to human beings in severe infections. Personally I would like to see thyroid extract, iodine or both given in the presence of infections. As a matter of fact, iodine in its various preparations, such as the syrup of hydriodic acid, has been frequently given in the presence of infections. In a district where endemic goiter is prevalent it should be of benefit and cause no injury, and it is a practical point that I am very anxious to follow up.

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* Read before a meeting of King County Medical Society, Seattle, Wash., Nov. 24, 1930.

[1] Read, J. M.: Correlation of Basal Metabolic Rate with Pulse Rate and Pulse Pressure. J. A. M. A., 78:1887-1889, June 17, 1922.

[2] Marine, David and Lenhart, C. H.: Relation of Iodine to the Structure of Human Thyroids. Arch. Int. Med., Vol. 4:440, Nov., 1909. Ibid., Effects of the Administration or the Withholding of Iodine-containing Compounds in Normal Colloid or Actively Hyperplastic (Parenchymatous) Thyroids. Arch. Int. Med., 253-270, Sept., 1909.

[3] Cole, W. H. and Womack, N. A.: Thyroid Gland in Infections; Preliminary Report. J. A. M. A., 90:1247-1276, April 21, 1928.

[4] Womack, N. A., Cole, W. H. and Heideman, A. G.: The Thyroid Gland in Infections; the Effect Upon the Basal Metabolic Rate. Endocrinology, Vol. 12, No. 6:769-790, Nov.-Dec., 1928.

[5] Cole, W. J., Womack, N. A. and Gray: Thyroid Gland Infections and Toxemias. A. J. S., New Series, Vol. 6, No. 2:220-229, Feb., 1929.

[6] Ibid.: Reaction of Thyroid Gland to Infections in Other Parts of the Body. J. A. M. A., 92:453-457, Feb. 9, 1929.

3. HEAT ELIMINATION

The increased heat elimination of even moderate hyperthyroidism is easily perceived by gross methods. It has long been my practice to take two blood-pressure readings during a physical examination, one at the beginning and one at the end. The second is usually taken with the patient sitting on the examining table and his arm steadied by placing the hand between my arm and chest. In moderate elevation of the basal metabolic rate, say around plus thirty or forty, the increased warmth of the hand is easily perceptible through my coat and vest. On several occasions with a marked elevation of the basal metabolic rate, the patient's hand has seemed so hot that I have again taken the temperature to make sure he had no fever.

4. THE TENDO ACHILLIS REFLEX

Nervous phenomena in hyperthyroidism are more or less symptomatic of fatigue and of irritation due to fatigue. The speed as well as the magnitude of reflex actions is increased. The speed is best demonstrated in the ankle jerk. One convenient method is to have the patient kneel on a chair, with the hands resting on the back and the feet hanging over the edge of the seat. Ordinarily there is a slight latent period between striking the tendo achillis and the initiation of the reflex. The latent period is diminished or absent in hyperthyroidism, especially in exophthalmic goiter. I have seen one patient who was unconscious and undiagnosed and, therefore, treated ineffectively for several days. On this phenomenon alone thyroid crisis was suspected. He was given iodine and was eventually prepared for a successful operation.

5. BRUIT HEARD OVER THE THYROID GLAND

Thyroid bruits are usually associated with exophthalmic goiter. French,[7] in the last edition of his Differential Diagnosis, mentions exophthalmic goiter only, in writing of bruit over the thyroid. Bruits are also heard in carcinoma and thyroiditis. One authority[8] states that the loudest bruits are heard in colloid glands. Should cardiac neurosis also be present, it would be very easy to misdiagnose as exophthalmic goiter. The administration of rather large doses of thyroid extract would cause the disappearance of the bruit within a few days. In any case, bruits over the thyroid are not pathognomonic of exophthalmic goiter.

6. THE DIFFERENTIAL DIAGNOSES BETWEEN HYPERTHYROIDISM AND NEURASTHENIA AND CHRONIC NERVOUS EXHAUSTION

Unfortunately there is no single differential point that divides hyperthyroidism from neurasthenia and chronic nervous exhaustion. Furthermore, a neurotic patient may have hyperthyroidism superimposed upon a neurosis. The history of a neurotic patient should show that the neurosis has been present not only during the present illness but also before, even back to childhood. Chronic nervous exhaustion is definitely associated with mental stress and strain. If we can show that these factors entered the patient's life at the onset of the present illness, we commence to doubt actual hyperthyroidism. Mild hyperthyroidism is often preceded by general infections.

There are other factors that help decide. They have been mentioned before by many others. Both hyperthyroid and neurasthenic patients are emotionally unstable, but the hyperthyroid patient has a selfassurance that the neurotic one lacks. The neurotic patient complains much. The relatives of the hyperthyroid patient are the ones that complain. The cold hand is rarely ever found in hyperthyroidism. In hyperthyroidism the nail bed often recedes and causes the patients to complain of sores under their finger nails or that their nails have been hard to keep clean recently. Both groups of patients may be fidgety. The patient with neurasthenic or chronic nervous exhaustion slouches while he fidgets, but the hyperthyroid patient interspaces his purposeful but useless motions with positions of relaxation, to rest tired muscles or groups of muscles. For example, after fixing a shoestring that does not need fixing and straightening a tie that does not need straightening, he will lean slightly back on the examining table and throw his weight on his arms which he has placed behind him. This relieves the tired muscles of his back.

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[7] French, Herbert: Index of Differential Diagnosis, Fourth Edition, 267, 1928.

[8] Plummer, H. W.: Thyroid Gland. The C. V. Mosby Co., St. Louis, Mo., 53, 1926.

There is one word of warning. One single factor must never make the diagnosis in these doubtful cases. For instance, persistent heart-hurry of over 90 per minute, continuous day and night and uninfluenced by digitalis, is considered by some pathognomonic of hyperthyroidism. While it is true that persistent and otherwise unexplainable tachycardia means we must consider hyperthyroidism, it is obvious that a constantly rapid pulse in the office is by no means an assurance of a rapid heart in a different environment. Every tree is known by the fruit thereof. If we think we have a case of neurosis or chronic nervous exhaustion and a regime including sedatives, such as bromides, gives relief, or if we think we have a case of hyperthyroidism and a ten day treatment with Lugol's solution brings marked improvement with increased hardness of the thyroid gland, we have the best confirmation that I know of that our diagnosis is correct.

7. BASAL METABOLIC DETERMINATIONS

In discussing the last point, I did not mention basal metabolic studies. Lahey,[9] in 1921, said that such study is of great value in diagnosing those cases of neurasthenia and associated neurologic cardiac disease, such as effort syndrome which often presents signs closely simulating those of hyperthyroidism, in that these conditions show metabolism estimations within normal limits.

Unfortunately a patient's emotional state or other factors often prevent the test from being basal. Wang and Hawks[10] have recently recommended for patients with extreme nervousness or those who have to wait a long time, a breakfast one hour before the test. This consists of 200 cc. of coffee free from caffeine, 16 mg. of saccharin, 30 gm. of medium cream and 25 gm. of potato chips. I have seen a rate of plus thirty gradually fall to zero on repeated tests. The only factor responsible for the lowering of the rate was the loss of apprehension on the part of the patient. Besides apprehension, Lahey mentions other factors that will cause false readings, as errors in the machine, such as leakage and old soda-lime. The instructions about food and exertion may not have been followed by the patient. Long continued diets such as those in diabetes change respiratory quotients and cause an error. Renal lesions, increased temperature, wasting diseases, pituitary and adrenal diseases cause error.

Therefore, in doubtful and mild cases, where the diagnosis hangs on a slight elevation of the basal metabolic rate, the diagnosis is insecure, if the rate has been determined by only one metabolic test. If there is any question of apprehension on the part of the patient, the test should be repeated daily until an average is struck.

CRYPTS OF MORGAGNI *

THEIR CLINICAL SIGNIFICANCE.

SOUREN H. TASHIAN, B.A., M.D.
SEATTLE, WASH.

Last summer, while attending the rectal clinics at St. Antoine Hospital in Paris, Bensaud, one of the greatest proctologists of France, said to me: "Monsieur, you Americans are very lucky to travel so much. Now when you go back to America, learn all you can about cryptitis and write to me all about it."

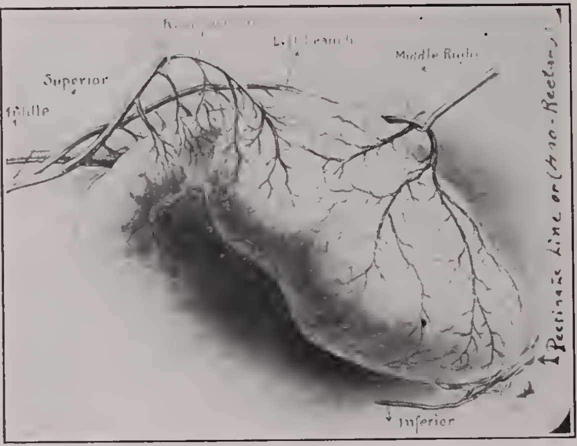

Fig. 5. Arterial supply of rectum.

My investigations for the last two years and a closer observation since Bensaud's request have impressed me that a thorough understanding of these pockets and a satisfactory method of treatment, when they are diseased, is essential for the "life, liberty and pursuit of happiness" of thousands of sufferers who knock at the doors of both regular and irregular doctors in search of relief. In fact, an anal fissure or fissure in ano, which is often due to a torn crypt, is probably responsible for more acute pain, suffering and discomfort than any other lesion of its size occurring in the human body.

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9. Lahey, F. H. and Jordan, Sara M.: Basal Metabolism as an Index of the Treatment in Diseases of the Thyroid. Bost. Med. Surg. Jour., Vol. 184, 14:348-358, Apr. 7, 1921.

10. Wang, Chi Che and Hawks, Jean E.: The Influence of a Special Breakfast on Basal Metabolism of Patients with a Pathologic Condition. Arch. Int. Med., Vol. 46, 2:316-320, Aug., 1930.

* Read before King County Medical Society, Seattle, Wash., Nov. 3, 1930.

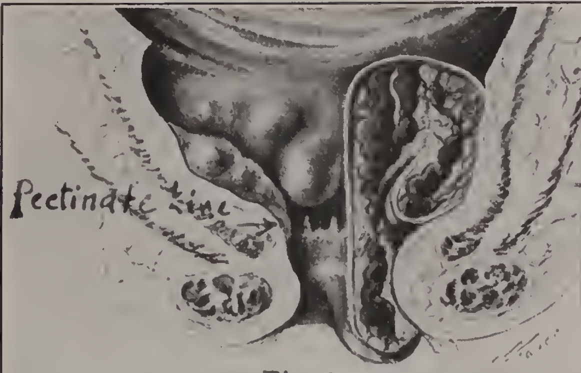

Fig. 1

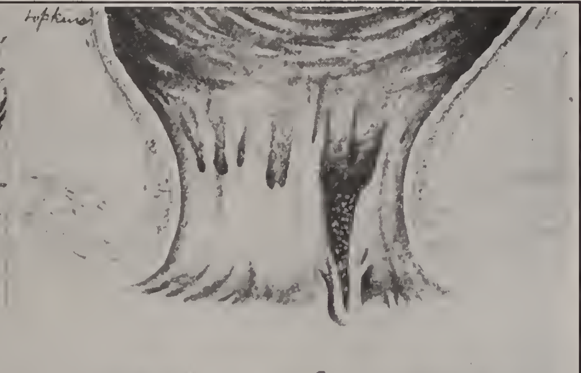

Fig. 2

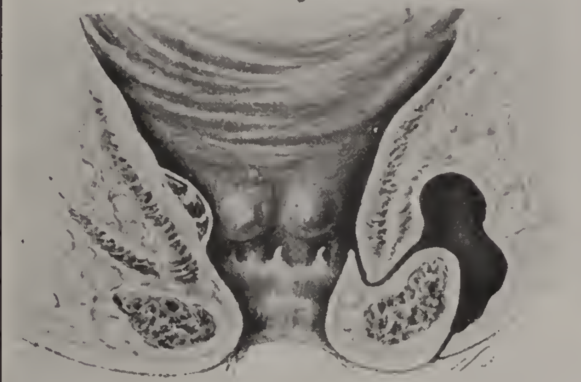

Fig. 3

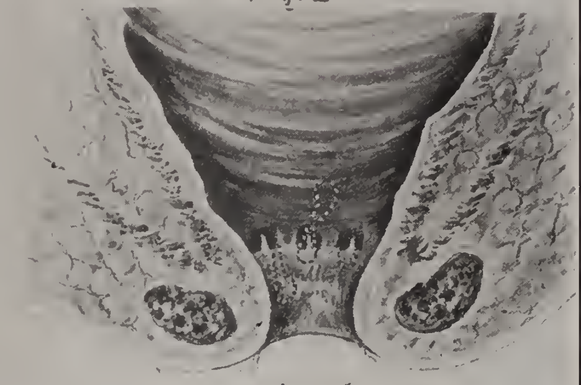

Fig. 4

Fig. 1. Showing anorectal or pectinate line as dividing line between superior and inferior hemorrhoidal veins.

Fig. 2. Fissure produced by rent in crypts of Morgagni.

Fig. 3. Showing ischiorectal abscess resulting from extension of infection from a rectal crypt.

Fig. 4. Crypts of Morgagni, showing the formation of subcutaneous and submucous sinuses.

To understand the pathologic processes peculiar to these anatomic structures, I will review briefly their embryology. On the eighth week of gestation the cloaca is divided into two parts; the anterior forms the urogenital organs and the posterior the rudimentary rectum. During the development of the rectum from the hypoblast and mesoblast, there simultaneously takes place invagination of the ectoderm. As this invagination increases, it presses and unites the epiblast of the proctoderm with the hypoblast of the hind gut, thus making the union of the rectum (entoderm) and anus (ectoderm) complete. The line of junction is called the pectinate or anorectal line.

This line has a very important clinical significance (fig. 5). At this point both the blood and nerve supply become differentiated. Here the superior hemorrhoidal veins originate, which empty into the inferior mesenteric vein and then to the portal circulation (fig. 1).

Below this point the blood is carried through the middle and inferior hemorrhoidal veins to the vena cava. Here, again, the nerve supply of the lower bowel changes. The rectum is supplied from the sympathetic system, while the anal canal, being lined with modified skin, receives its nerves from the third and fourth sacral and internal pudic nerves. Thus it is evident why any lesion below the anorectal line is so painful. For here are the sensory cutaneous nerves, while above the line the innervation is visceral.

The crypts of Morgagni are small pockets under the semilunar valves, which give the dentate appearance to the anorectal line. In some individuals they are larger, especially at the posterior commissure. The mouths of these pockets are opened upwards, facing the bowel current. Thus feces and swarms of bacteria lodge here, such as B. coli, streptococcus-fecalis, staphylococci, etc.

It is easy to see why they might act as foci of infection with systematic symptoms or they get inflamed and hypertrophied. If they are torn they form painful fissures (fig. 2), or the tissues are undermined, gravitating to the weakest point, generally to the ischiorectal fossa. Here the low resistance of the fatty tissues makes a fertile soil for bacteria. Thus abscesses form which eventually are opened externally and you have a fistula in ano (fig. 3).

These fistulas invariably have an internal opening except those from external injuries and diseased bones or possibly a boil, though of very remote possibility. Inflamed crypts, besides giving local symptoms of pain and itching or the formication of hypertrophied papillae and sphincteric spasm, may cause disturbances in adjacent and distant organs, such as of the urogenital tract, of the abdominal viscera or radiating pain to the perineum, to the leg, sacrum or coccyx. Often these patients have pruritis, disturbances of menstruation, malaise, headaches and in long standing cases they become extremely nervous and irritable.

We believe that the internal openings of the greatest majority of fistulas are located at the anorectal line, having their openings at a crypt (fig. 4). Of course, the starting point may be all along the lumen, if we consider foreign body injuries, tuberculous ulcerations, stricture of the rectum or other abrasions which are relatively of rare occurrence.

It is almost heart-breaking to see these patients operated upon time after time with only temporary relief. I was fortunate to have the opportunity to watch the operative procedures and results of many leading clinics both in this country and abroad. I believe the chief cause of recurrences is the failure of finding the internal opening and the blind acceptance of the traditional theory of "blind external fistulae."

Collier Martin and his associates in Philadelphia are the most emphatic on this point. They consider it the surgeon's failure, though he may not be able to find the minute internal opening, even after painstaking search. However, our failure does not give us a right to call it a blind external fistula. Yeoman says in his book, "just why a blind external fistula does not heal is more of an enigma." But further down on the same page he concedes the possibility of a minute undiscovered opening. Thanks to the kind and courteous permission tendered me at the different clinics, I fully believe that the surgeon who patiently searches and finds an internal opening and excises the tract, invariably cures the so called blind external fistula. If the surgeon does not find the internal opening, he should frankly tell the patient of the possibility of a recurrence and avoid future embarrassment.

Of course, one should avoid making an internal opening, if it is not discovered at the time of the operation. A small hooked probe is of inestimable value in discovering these inflamed diseased crypts or locating these minute evasive openings.

1604 Medical-Dental Building.

Incomplete Dilatation of Lungs as Factor in Neonatal Mortality. According to Yandell Henderson, New Haven, Conn. (*Journal A. M. A.*, Feb. 14, 1931), the natural stimulus initiating breathing in the normal child at birth can now for the first time be stated on sufficient evidence to be the carbon dioxide produced in its own body. While physiologic theory for many years past has suggested this view, the objection could not be overcome that a nonbreathing child probably has a higher pressure of carbon dioxide in its blood than one that breathes spontaneously. The evidence from the effects of inhalation, as set forth by the author, clears away this objection. It shows that the asphyxiated respiratory center of the newborn, or of a drowned person, requires a much higher pressure of carbon dioxide than does a normal center to stimulate it to respiratory activity. For the asphyxiated new-born child, dilatation of the lungs with a mixture containing a sufficient amount of carbon dioxide in oxygen to stimulate natural breathing is the one really effective method of resuscitation. Inhalation of this mixture is equally important for many children that breathe spontaneously; for among these cases incomplete dilatation of the lung is a common condition, predisposing to pneumonia and causing nearly as large a mortality as stillbirth itself. This inhalation should therefore be administered not only to those infants who require it for resuscitation from asphyxiation but to all children, even to those that appear entirely normal, during the first few days of life, as a prophylaxis against continuing partial atelectasis, secondary asphyxia and pneumonia. Every maternity hospital should be equipped with at least a simple inhalator for the newborn, or better with an inhalator suitable for infants and adults as well, so that the mother may also be treated when an anesthetic or narcotic has been used. For deliveries outside of hospitals the city health departments should provide simple infant inhalators to be rented to obstetricians and midwives for the cost merely of the oxygen and carbon dioxide consumed. After a reasonable period of education for obstetricians, midwives and nurses, a legal requirement similar to that for prophylaxis of blindness should be established. Only under such requirement will the inhalational prophylaxis of atelectasis come into such general use that it may save the greatest possible number of lives.

Feeding of Gastric Tissue in Treatment of Pernicious Anemia. Sixty patients who have pernicious anemia have been treated by H. Milton Conner, Rochester, Minn. (*Journal A. M. A.*, Feb. 14, 1931), with gastric tissue of swine or with tripe. Two of these were given gastric tissue of swine after virtual failure with tripe, and tripe constituted the sole form of gastric tissue given to two. Forty-six of the patients have been carefully studied under observation in a hospital. Raw and dried preparations have given approximately equivalent results. The mucosa, the remainder of the stomach after the mucosa was removed, and whole gastric wall were used separately, and each proved effective in the cases treated. The presence of muscle meat was not required to obtain results in the two cases treated with mucosa without muscular coat or other muscle meat. Fundus and pylorus, each used separately, produced satisfactory if not equal results. The effects on the reticulated erythrocytes, mature erythrocytes, hemoglobin and leukocytes are similar to and apparently equivalent to those obtained by feeding liver or liver extract. The effects on the general and neurologic symptoms are apparently about the same as those obtained with liver or its extract.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington and Idaho

Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

MARCH, 1931

EDITORIAL

HARBORVIEW HOSPITAL

For many years King County hospital in Seattle has been an object of caustic criticism and many charges of inadequate service, most of which were unwarranted. The prime cause of these attacks has been the antiquated and crowded condition of the institution. Originally built to accommodate about two hundred patients, several wards have been added of frame construction which have increased the capacity of the institution. In addition the wards have been crowded to capacity with only walking space between the beds, even the halls being lined with patients so that nearly five hundred beds have been necessitated. It has long been the hope and dream of the public that an adequate, up-to-date hospital might some day be constructed.

About two years ago the people voted a bond issue of $2,750,000 for the construction of a new hospital. The county commissioners devoted $240,000 for the purchase of a site on Ninth avenue between Jefferson and Alder streets. This comprises two blocks on the west side of the avenue and two half blocks on the east. The hospital is now completed, which has been under construction during the past year. It is the outstanding feature of the skyline as seen from the bay. It is twelve stories in height, built of reinforced concrete with light brick surfacing. It is as complete and modern in its furnishings and equipment as can be devised by the most experienced advisers. Dr. W. H. Walsh of Chicago, the hospital expert, has been constantly in contact with the construction and equipment of the institution. The first floor is devoted to administration, residence of interns, the roentgen-ray, physical therapy and laboratory departments. The outpatient department is located on this floor and in that below, which is on the ground level at the rear. The top floor is devoted to pediatrics, another to obstetrics and a third is for the nursery and postnatal women. One floor, with accommodation for about forty patients, is for the psychiatric department. No longer will the unfortunate insane of the county be committed to the county jail and be housed as criminals, as has been the custom in past years. Provision is made for sessions of the insanity commission as well as a small court room. The most modern treatment of psychiatric patients can be administered for border-line cases, whom it may not be necessary to commit to the state institution. Beside general surgical wards others are equipped for orthopedic work, brain surgery and other subdivisions of a complete institution.

The ultimate capacity of this hospital will be one thousand beds and the mechanical construction and services are installed for an institution of that size, although the present capacity will be about five hundred. The kitchen, with a multiplicity of labor saving devices and apparatus that meet latest demands of the dietitian, is a revelation to one not familiar with the latest advances in the culinary art. The whole equipment of the institution and its furnishings comprise the latest devices for the scientific and most effective care of the sick.

The hospital faces Ninth avenue on the east. Across the street is the nurses' home, a ten-story building of the same structure and style as the hospital, built to accommodate two hundred nurses. The hospital is opened with a force of seventy,

HARBORVIEW HOSPITAL

This cut presents the completed building according to the architect's drawings. The wings at either end have not been constructed. To the left appears the psychiatric unit which will be built in the future. This view is from the west, the hospital facing the east on Ninth Avenue. The nurses' home, laundry and power plant on the east side of Ninth Avenue are not shown.

who will be increased as the necessity demands. A tunnel beneath Ninth avenue connects this building with the hospital. Adjacent to it are the hospital laundry and power house. This nurses' home is a model, being a most attractive building in every respect. The comfort and needs of the nurses have been provided with great care. Reception rooms and gymnasium have been properly furnished. There is a model auditorium with stage and moving picture booth, which will be available for the use of interns and the staff as well as the nurses. An agreement has been perfected with the University of Washington, according to which its course in nursing and the hospital school of nurses will be united. The combined course will cover five years, at the treminus of which the student will receive her degree of B.S. as well as hospital diploma.

The old hospital in the southern section of the city will be continued for the care of chronic and convalescent patients as well as King County Home, south of this institution. All will be included under "King county hospitals." Dr. William H. Corson, who has been superintendent of the old hospital, will continue to direct the management of the new institution. Its successful establishment and auspicious opening last month has been due largely to his wise and energetic supervision.

IRREGULARS ON THE HOSPITAL STAFF

Whenever a public hospital is constructed and opened for the reception of patients, there ensues a clamor on the part of various irregular practitioners and their adherents for the opportunity of treating patients in accordance with their peculiar tenets and practices. This has recently been illustrated in connection with opening Harborview Hospital at Seattle. Chiropractors and drugless healers united in a vociferous demand that a portion of the hospital be set aside for their use in the treatment of patients. The county commissioners gave a public hearing, at which the reasons for such privilege were presented, with statements to the contrary by representatives from the medical profession. These petitioners and their supporters claimed the right of utilizing this public institution, since otherwise they are being taxed without representation. They claimed that a large proportion of the citizenship are being treated according to the principles which they maintain and that patients in the institution should have the privilege of choosing these practitioners and their methods of treatment, if they so desired. Some of the medical speakers stated they had no quarrel with these irregulars as to their methods of procedure but called attention of the commissioners to the fact that the hospital could not be rated according to the standards of the American College of Surgeons, if these irregular practitioners were permitted to participate in the treatment of patients. Neither would interns or nurses consent to serve under the direction of any except regularly educated physicians and surgeons. In due time the board of county commissioners announced their decision against permitting these irregulars to practice in the hospital, giving as their reason the above mentioned objections.

On due consideration of this subject any physician will agree that the profession has a quarrel with these irregulars as to the propriety of their treating patients in any public hospital in addition to the reasons given above. There is no occasion to pussyfoot the question. The fact should be clearly stated and presented to the public that chiropractors and drugless healers are not entitled to practice their alleged forms of treatment under public expense. This hospital has been constructed at a great cost from money which will be obtained through taxation. It has been provided with the best equipment and furnishings available. It is the intention to extend to the patients the most scientific and advanced treatment known to the science of medicine. These irregular practitioners can in no sense qualify under these requirements. According to the Washington legislative act providing for the licensing of chiropractors, it is stated, "Any chiropractor who has complied with the provisions of this act may adjust by hand any articulation of the spine, but shall not prescribe for or administer to any person any medicine or any drugs now or hereafter included in materia medica, nor practice obstetrics, nor practice osteopathy or surgery." Likewise the act providing for the licensing of drugless healers specifies that they shall be examined on anatomy, physiology, hygiene, urinalysis, symptomatology, hydrotherapy and gynecology. Certificates are issued to these applicants authorizing them to follow certain definite forms of practice, as mechanotherapy, suggestive therapeutics, food science, physcultopathy. In both acts it is distinctly specified that these physicians shall not be designated as doctors nor use the abbreviation Dr. It is to be noted, therefore, that these irregulars can legally practice only along limited, specific lines, thus withholding from their patients many scientific methods of treating ailments, with which citizens of the county are entitled to be cared for at public expense. Accordingly such practitioners cannot offer the best treatment to those citizens needing attention for disease or injuries. These reasons should be sufficient to exclude from any public hospital practitioners who claim to treat the sick according to a single method of practice and are uneducated and untrained in the employment of all possible methods to cope with disease. It is seasonable that those in control of an institution of this character should announce these principles to the public and let it be understood that public institutions are to be conducted in accordance with the most scientific and advanced principles available.

UNIVERSITY GRADUATE COURSE

The only effort which is made by the University of Washington to offer medical education is comprised in the Graduate Medical Course under the auspices of the Extension Service which is scheduled each summer in Seattle. The course this year will cover five days, July 13-17. The object is to offer a week of consecutive study on subjects which will interest every practitioner, whether in general practice or following a specialty. Each day features of interest will be presented from 9 a.m. to 10 p.m. This continuous service is the result of a questionnaire sent to physicians who have been accustomed to attend this course, who replied that they desired a program which would be really worthwhile, that might include intensive courses of study.

The faculty will consist of Dr. William D. Haggard of Nashville, Tenn., professor of surgery at Vanderbilt University, who will deliver lectures on surgery. Dr. John H. Stokes, professor of dermatology at the University of Pennsylvania Medical School, will deliver a course on dermatology with special emphasis on syphilis and its treatment. He is the only American on the international committee for the control of venereal disease of the League of Nations. Dr. George M. Piersol, professor of medicine at the University of Pennsylvania Medical School, will deliver the medical lectures. Dr. Carl H. Davis of Milwakee, Wis., professor of obstetrics and gynecology at Marquette University, will lecture on these subjects. He has many new ideas which will be of value to all practitioners. Lectures wil be held at nine, ten, and eleven and one o'clock, with luncheon from twelve to one. Clinics will be held until 4 p.m. by Seattle practitioners, followed until 6 o'clock by clinics under the direction of the lecturers. From this until 7:30 there will be an informal dinner, followed by a lecture from one of the faculty. The day will end with a lecture delivered by a member of the University of Washington faculty. Such a program ought to satisfy the most avid searcher after medical information.

THE WOMAN'S AUXILIARY

During recent years the Woman's Auxiliary of the American Medical Association has established branches in connection with a large proportion of the state medical associations. They seem to have functioned with satisfaction and profit both to the members of the state associations and their wives. Their activities have extended in many directions and have covered many enterprises of value to the medical profession and the general public.

Auxiliary branches have existed for several years in Oregon and Idaho. They have presented interesting annual reports in connection with the regular meetings of their state associations. Thus far no auxiliary has been established in connection with the Washington association. Inquiries have been made of late from the officials of the national organization concerning the formation of such a branch. From time to time reports are received relative to the activities of the auxiliary in different sections of the country. On another page will be found a report covering the functioning of branches in the northern central states. These indicate some of the work in which the women are engaged. It may be of interest to review this report.

MEDICAL NOTES

American College of Physicians will hold its annual meeting at Baltimore, March 23-27. This is one of the outstanding medical gatherings of the year. The program includes a wealth of papers on all phases of medical practice, which it would be impossible to specify in this notice. Special clinics and demonstrations are arranged for in great profusion at Johns Hopkins Hospital as well as other hospitals of the city. Besides papers on individual subjects, symposia are scheduled on endocrine disorders, anemia, heart disease, gastric intestinal diseases and public health. Anyone who can find it possible to attend this meeting will be abundantly awarded for the time and effort expended.

The American Association for the Study of Goiter will hold its annual meeting at Kansas City, April 7-9. The program includes prominent practitioners from various parts of the country who are well known in connection with the study and treatment of this disease. Each day are listed diagnostic clinics, pathologic conferences, surgical clinics, addresses and papers. All phases of the study of goiter will be included among these different features.

OREGON

New Clinic Opens. The new University of Oregon Medical School Clinic on Marquam hill, Portland, was opened February 2. This replaces the old Portland Free Dispensary at 274 Fourth Street. It has a capacity of one thousand persons a day, while about a quarter of that number are treated at present. It is staffed chiefly by members of the faculty of the University of Oregon Medical School. This building was a gift from the general education board of New York, connected with the Rockefeller Foundation. The four-story concrete structure cost $300,000, an additional $100,000 being spent for equipment. It is exclusively for treatment of the indigent sick and will not compete with private practitioners.

Hospital Building Programs Announced. The main unit of the new St. Mary's Hospital at Astoria will be started soon at a cost of approximately $250,000.

Also enlargements and improvements at Good Samaritan hospital in Portland, to cost $500,000, have been recommended by Rt. Rev. W. T. Sumner, bishop of the Episcopal Diocese of Oregon. This will include a new nurses' home and new administration building.

Lecture by Belgian Professor. Members of the University of Oregon Medical School and the Portland Academy of Medicine were fortunate in hearing Professor Jules Duesberg, head of the department of anatomy and president of the University of Liege, Belgium, who delivered an address in the auditorium of the Medical Dental building, Feb. 18. The subject of his address was "The Causes of Unequal Cell Division."

Medical Officer Transferred. Dr. M. B. Marcellus, medical officer, U. S. Veterans' hospital at Portland for the past six years and previous city health officer of Portland, has been transferred to the diagnostic center, Veterans' Hospital at Palo Alto, Calif.

Appointed Medical Examiner. Dr. Delbert Standard of Eugene has been appointed medical examiner for applicants for the Citizens Military Training camps, to be held this year at Vancouver Barracks, Wash., during June and July.

Basic Science Bill Up. Oregon has a basic science bill before its legislature at this session. It is being sponsored and approved by various state and county medical societies and, as usual, is being bitterly fought by the cultists.

Newly Appointed County Physician. Dr. Verden E. Hockett, an associate of Drs. Sauerman and Syeeves of Salem, was appointed county physician to succeed Dr. W. Carlton Smith who died a few weeks ago.

Clatsop County Election. Dr. S. G. Morgan of Astoria was elected president of Clatsop County Medical Society, held last month at the Columbia hospital, Astoria. Dr. N. W. Hyde was named vice-president and Dr. Joseph McConnell, secretary, both of Astoria.

Klamath and Lake Counties Medical Society held a meeting at Klamath Falls January 20. Dr. Ralph W. Stearns was elected president; Dr. L. G. Gass, vice-president and Dr. Harold Brown, secretary-treasurer, all of Klamath Falls.

Dr. Charles H. Atwood has located in Wendling.

Benton County Medical Society met February 10 at a luncheon meeting at Hotel Benton, Corvallis, to hear Dr. G. C. Bellinger of the Oregon State Tuberculosis hospital of Salem. The address was entitled "Tuberculosis in Children."

Dr. J. R. Harvey, newcomer from the Eugene section, is opening offices at Vale.

WASHINGTON

Seattle Marine Hospital. With tentative building plans approved by Secretary of the Treasury Mellon, the Beacon Hill project at Seattle draws nearer. The hospital is to be a ten-story structure of tower design, which is radically different from any building previously erected by the Public Health Service.

Harborview Hospital Dedicated. On February 27 King county's new $2,750,00 Harborview Hospital was formally dedicated. The structure, built of reinforced concrete and faced with cream brick and terra cotta, consists of a hospital proper twelve stories high with a fifteen story tower, an adequate nurses' home and a central heating and power plant. The building is complete from an architectural and medical standpoint, and has drawn considerable praise from prominent visitors during its dedication.

Triological Society Meeting. Erstwhile ear, nose and throat men recently met in Seattle under the title of the American Triological Society. Dr. A. T. Wanamaker of Seattle, chairman of the section, presided. Speakers at the meeting included Drs. G. W. Swift, Seattle; E. R. Lewis, Los Angeles; H. B. Graham, San Francisco; O. Larsdell, University of Oregon Medical School; R. A. Fenton, Portland; E. F. Chase, Seattle and F. E. Sprowl, Spokane.

When Good Fellows Get Together. The announcement of a joint meeting of the Wala Walla County Bar and Walla Walla Valley Medical Society seems unique. The occasion was a meeting addressed by Judge J. N. Sharpstein of the superior court on medicolegal jurisprudence.

At Washinton Conference. Dr. A. E. Anderson, president of Washington State Medical Association, visited in Washington, D. C., last month, where he attended the conference on child health and protection at the invitation of President Hoover.

Cowlitz County Medical Society held a meeting at Longview Feb. 10. About 20 members were present. Miss Helen Wilcox, secretary of the Public Health League, and Dr. E. O. Jones, both of Seattle, addressed the society.

School Board Resignation. Dr. C. W. Sharples, oldest member of Seattle school board in point of service, announces he will not be a candidate for reelection.

Dr. W. P. Rice, physician aboard the coast guard cutter Tallapoosa for the past two years and previously located at Tacoma, is now locating at Nesplem for duty on the Colville Indian reservation.

New Arrival. Dr. E. B. Burwell, formerly house surgeon to the New York Eye and Ear Infirmary, has located in Centralia.

Dr. H. C. Turner, previously of Seattle, has located at Wrangel, Alaska.

Dr. I. W. Powell, city health officer at Bellingham, is in the middle West doing some postgraduate work at the University of Rochester and in Chicago. During his absence Dr. Jacob Smith will act as health officer.

Transferred. Dr. F. W. Spickard of Port Townsend has recently been transferred to the Public Health Service at Washington, D. C.

Dr. S. E. Lambert was elected president of the medical staff of St. Luke's hospital of Spokane for the ensuing year. He succeeds Dr. C. H. Veasey, Jr.

Dr. J. F. Christensen has recently been appointed county physician and health officer at Kelso for a two year period.

Dr. R. N. Hamblen of Spokane was recently chosen president of the Kiwanis Health Center corporation.

Weddings. Dr. Walter Kelton and Miss Gladys Wilhelmina Jochem, both of Seattle, have recently announced their marriage. Dr. R. W. Perry and Miss Ruth Wood of Seattle were married Jan. 31.

IDAHO

Incorporation Papers Filed. The Lakeside Hospital and Medical Building filed articles of incorporation at Coeur d'Alene last month. The men associated with the project are Drs. E. L. Spohn, H. J. Sturgis and Henry Spohn.

Addition to Hospital Completed. The county commissioners are laying plans for the addition of a new wing to be added to the Summerville home at Lewiston.

Appointed County Physician. Dr. W. W. Brothers was recently appointed county physician at Pocatello.

Dr. Thomas Mangum of Nampa was recently appointed county physician of Canyon county for the ensuing year.

Dr. O. D. Platt of St. Maries recently was appointed city health officer to succeed Dr. G. G. Espe.

Dr. G. G. Espe, formerly of St. Maries, has taken over the office of Dr. G. H. Cooper and will continue his practice in Burley.

Dr. J. W. Hammer, of Middleton, where he has resided for twenty-seven years, is now located in McCammon.

OBITUARIES

Dr. Ernest C. Wheeler of Tacoma, Wash., died January 21, following a brief illness, aged 59 years. He was born November 8, 1872, at Manchester, Ia. He was graduated from Cornell College and Rush Medical School, where he also did postgraduate work. He served as major in the World War from September, 1917, until after the armistice. He was a member of the American College of Surgeons and past president of the Puget Sound Academy of Opthalmology.

Dr. Cora Turner Saxe of Seattle, Wash., died January 24 at the Swedish hospital, aged 72 years. She was born at Darien, Wis., in 1859 and graduated from the Valparaiso Normal School, Valparaiso, Ind., and later took her medical degree at the University of Michigan Medical School. She was for a number of years in charge of the children's branch of the Seattle department of health.

Dr. Adelbert W. Thorpe died February 5 at Great Falls, Mont., after a long illness, aged 69 years. Dr. Thorpe retired from official work in the East three years ago because of illness and with his family moved to Bellingham, where he made his home. He was born in 1862. He received his medical training at the St. Louis College of Physicians and Surgeons, where he graduated in 1895.

Dr. Horace Mayo Boyden of Portland, Ore., died at the Peter Bent Brigham hospital in Boston February 3, aged 23 years. He was a graduate of the University of Michigan Medical School and had recently been appointed to the interne staff of the Peter Bent Brigham hospital. He was the son of Dr. and Mrs. Frank E. Boyden of Portland.

Dr. Ammi Sibley Nichols died at Portland, Ore., January 23. His death occurred on the day following his seventy-seventh birthday anniversary. He has lived in the Northwest since 1877 and in Portland since 1880. His medical education was obtained at the Hahnemann Medical College, Philadelphia, where he was graduated in 1876.

Dr. Frederick John Laird, of Portland, Ore., died Feb. 14, aged 59 years. He was a graduate of the Michigan College of Medicine and Surgery and had resided for a number of years at Lebanon before moving to Portland.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

The general meeting was held in the auditorium of the Medical-Dental building, Seattle, Feb. 2, with Dr. McCurdy in the chair. About one hundred members were present. Minutes of the meeting of Jan. 5 were read and approved.

Dr. W. A. Ash read a paper on "Medical Aspects of High Intestinal Obstruction." The basis of this condition is alkalosis, a toxemia in which there are lowering of blood chlorides, elevation of nonprotein nitrogen and CO_2 plasma combining power. Symptoms are caused by vomiting which results in dehydration and its consequences. Also there are symptoms of circulatory origin, as well as neuromuscular, such as irritability and often gastric tetany. Conditions were enumerated in which this toxemia is observed. Conditions were discussed on which diagnosis is based. Medical treatment, preparatory to surgery, includes the ingestion of water by all routes, although the possibility of water logging must be kept in mind. Gastric lavage must be given as often as necessary. The paper was discussed by R. D. Forbes and C. E. Hagyard.

Dr. F. M. Dwyer presented a paper on "Clinical and X-Ray Study of Gastric Tumors." While diagnosis of gastric cancer is commonly established, the majority of cases are inoperable at this time. Thirty-eight per cent of patients present good histories of dyspepsia, averaging ten years before onset of symptoms. Seventy per cent had free hydrochloric acid in gastric contents. The value of careful palpation of the partially filled stomach during fluoroscopy was emphasized. The patient should have the benefit of exploration unless there are skin metastases or fluid in the peritoneal cavity. The paper was discussed by Homer Wheelon and W. A. Millington.

Dr. K. K. Sherwood was elected to membership.

The medical section of the society held a meeting Feb. 9, with Dr. D. H. Nickson presiding.

Dr. W. J. Kerr of University of California Medical School presented a paper on "Recent Experimental Studies on the Peripheral Circulation with Special Reference to Raynaud's Disease." Few facts regarding cause or treatment have been added to the original reports of Raynaud. The experimental methods utilized in the study of this condition were described. The origin of the impulses producing the characteristic syndrome were shown to be peripheral rather than central. The site of the local defect is in the local axon of vasocontractor fibers and the pathology is local. Treatment consists of immersing the extremities in a cold bath three times daily for ten minutes, beginning at 10° C. the first week and decreasing to 4° in the fifth week. Sympathectomy for this condition is not entirely rational, although beneficial in preventing attacks.

Dr. T. W. Mitchell reported two cases of black tongue. He described the symptoms of the condition and its treatment.

Dr. Thomas Morcom presented a preliminary report of the Publicity and Emergency Committee.

PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the auditorium in the Rhodes Medical Arts Building, Tacoma, on February 10, Dr. D. M. Dayton in the chair.

Dr. J. H. Harter of Seattle gave a paper on "Plastic Surgery of the Nose." This was an exhaustive study, with reports of many cases of deformities of the face, especially the nose, and was illustrated with slides. It was discussed by Drs. Griffith, Bell, Mattson, J. A. Johnson and Willard.

Dr. C. V. Lundvick read a paper on "Medical Examination of the Eyes," which was a detailed review and explanation of what goes on in the opthalmologist's office during a study of the eyes. Discussion was by Drs. W. C. Cameron, Maddison and Griffith.

Dr. Charles Firestone was elected a member of the society.

A resolution was passed to continue the Better Business Bureau Service for the current year.

WALLA WALLA VALLEY SOCIETY

Pres., F. M. Campbell; Secty., G. C. Daniels

Walla Walla Valley Medical Society held a meeting at Walla Walla Feb. 12. More than 35 members were present.

Dr. M. E. Steinberg of Portland delivered an address on "Surgery of the Abdomen," illustrated with lantern slides. Dr. G. C. Schauffleur of Portland gave an address on "Diseases of Children."

IDAHO

KOOTENAI COUNTY MEDICAL SOCIETY

Pres., J. W. West; Secty., J. T. Wood

The annual meeting of Kootenai County Medical Socoiety was held at Coeur d'Alene, Jan. 21. The following officers were elected for the ensuing year: President, Eugene L. Spohn; vice-president, J. C. Dwyer; secretary-treasurer, John T. Wood; delegate to state meeting, Alexander Barclay.

It was voted to take up the matter of revision and codification of the Idaho State quarantine laws through the legislative committee of the Idaho State Medical Association.

It was also voted to take the necessary steps to interest the county and city, the Red Cross and the practicing physicians of the community in putting in a clinical laboratory.

PANORAMIC VIEW OF THE WOMAN'S AUXILIARY IN NORTH CENTRAL STATES

Mrs. James Blake

HOPKINS, MINN.

Organizing Chairman of the Northern District

According to the constitution and by-laws of the Auxiliary to the American Medical Association, the organization program is carried on by the active work of the vice-presidents. Mrs. Southgate Leigh of Norfolk, Va., is first vice-president and automatically chairman of organization. Due to her location on the map, the second vice-president finds herself interested in the destinies of the North Central group of states.

Looking backward with pleasant memories to Detroit and forward with delightful anticipations to Philadelphia, we find this group of states all doing something of common interest.

In the January issue of the *Journal of the Indiana Medical Association,* the auxiliary president stresses the importance of more constructive work on the part of her organized county groups. "Physicians' wives," she says, in her New Year's address, "hold an enviable position in being privileged to have a part in a world wide health program, and I would urge every physician's wife to bring before other women dependable knowledge, and a just appreciation of the real spirit and purpose and actual achievements of the medical profession." So from Indiana we know we are to have constructive work during this year. Physicians as a class are not prone to participate in legislative matters but when four distinctly separate bills which affect the profession directly are presented during one session of a state's legislature, it is time to be up and doing.

Such is Indiana's stiuation this year and the doctors of the seventh district have thought it worthwhile to instruct their auxiliary members on these subjects that their influence may be properly used The *Indiana Journal* never fails to give the auxiliary space, and it is little wonder the Indiana women are up and coming, when they have such editorial notes to enlighten and guide them in their constructive program work as one finds in this same journal.

Kansas is slowly getting a few things accomplished. A world-wide depression has rendered prophets quite fameless abroad as well as at home, but the doctor's wife in Kansas is coming into her own, and we prophesy that the auxiliary will climb to the top, due to the indomitable spirit of the leaders in that state.

In Illinois the motto might well read, "Builders we are, and builders we must ever be. Builders, not in stone that shelters life, but builders in life." We find good constructive programs of well-balanced educational value, we find a journal ever ready to broadcast auxiliary news, and best of all, we find a healthy organization line-up, and an advisory board from their medical society. Several of their county groups are having their members get busy with the "Health Audit Program."

One project of worthy mention comes from Vermillion county on the eastern boundary of the state. The county auxiliary put on the Health Institute in Danville last November. A member from every agency in the county, working out any kind of a health program, was included in the personnel of the speakers. It was for just one day, but it was worth three hundred and sixty-five as a rouser for auxiliary work. It really was sort of a Christmas seal campaign opening, a get together of club women, and P.T.A. groups in the county. And what a wise idea for a medical auxiliary to have the headlines in the plans for such a "Health Day."

Wisconsin, Iowa and South Dakota are among the latest states to join the National Auxiliary. Organization is the keynote for their work, and the national study envelopes are offered as program material. Right now, if the modern doctor's wife needs to get one thing more than another from her organization, it is the knowledge of what is going on in this world, especially the world of medicine. Women are discriminating more carefully in the clubs they are joining. They are asking what membership will mean to them, what they will get out of it. For that reason the subjects for study should be more carefully chosen, and the roll call should be made to count for something more than jokes and quotations from forgotten poets. It is not a pleasant feeling for a busy mother who rides miles to a meeting to say when it is all over, "I can't say I know any more now than when I started." And so we find these three states getting themselves established on a firm foundation, with the national program envelopes scattered far and wide to aid and encourage auxiliary members already in and prospective members.

Montana and North Dakota are debating pro and con, but, as Mrs. Hoxie said in her Detroit report, "I believe it will be a mistake from now on to organize a new state, unless it appears reasonably certain that there is interest enough among the doctors who want the auxiliary, so they will foster it and stand back of it." And so we leave Montana half hearted about forming an auxiliary, and North Dakota undecided.

We find Michigan giving intelligent cooperation with state and county officials. Women, like men, are interested in the improvement of civic affairs and healthful living and are realizing that they need to be armed with a definite knowledge of health laws and public health practices.

Missouri is in a very healthy condition. We find that Mrs. A. B. McGlothan, the president-elect of the Woman's Auxiliary to the American Medical Association, will attend President Hoover's White House Conference for Child Health and Protection to be held in Washington, D. C., February 19 to 21. Mrs. G. H. Hoxie, president for last year, will also attend the White House conference.

Minnesota has had a busy and successful year on organization. The president and organization chairman have visited over the state and planned meetings and educational programs with many county groups. In October the International Medical Assembly met in Minneapolis, and at this time the Hennepin county auxiliary celebrated its twentieth anniversary by being hostess for five days to the visiting doctors' wives. A great many social affairs and an educational day, which included a speaker on public health, were features. Hennepin county is having a year with a definite program. Each month a speaker is scheduled, and one meeting during the year is reciprocity day and each auxiliary in the state is invited to send visitors. This group features philanthropic work for tuberculous patients at Glen Lake and does much for the library at the sanatorium. They have helped the medical society furnish its library and club rooms, spending $1000.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Nosography. The Evolution of Clinical Medicine in Modern Times. By Knud Faber, M.D., LL.D., Professor of Internal Medicine, University of Copenhagen. With Introductory Note by Rufus Cole, M.D., Director of Hospital, Rockefeller Institute. With 22 full page portraits. Second Edition, Revised. Cloth, 213 pp. $3.75. Paul B. Hoeber, Inc. New York. 1930.

The history of nosography or the description of disease must be coeval with the knowledge of disease in its various periods of growth and development. This book, then, is in reality a history of the evolution of internal medicine from the sixteenth century to the present day.

Scientific nosology began with Thomas Sydenham of London in the latter part of the sixteenth century, who put medicine on a strictly clinical basis by close observation of the symptoms of disease, and he was the first to discover that each was a clinical entity with a very definite picture of its own. He began with the description of the more common communicable diseases but had much difficulty with chronic ailments, although the first to depict chorea and to differentiate gout from rheumatism. He never relied upon former authors' descriptions of disease and, when asked by an eager young doctor what he should read to improve himself medically, Sydenham replied, "Read Don Quixote." Like all great men he was able to distinguish the essential from the immaterial. During his time classification depended on grouping of symptoms.

Later the Paris school dominated medicine with pathology as a basis and Laennec, with his stethescope, was able to compare the living with the dead pathology in lung lesions and by this means differentiate for the first time various pulmonary diseases that had been hitherto lumped together as peripneumonia. Pathologic anatomy became the basis of medical nosography on the foundation of physical diagnosis, established by Laennec with his stethescope, and this movement controlled medical thought till the middle of the nineteenth century.

Then physiology had its way and became especially ascendant in Germany. The work of Ewald in examination of stomach contents, of Rosenbach in attempts to determine the heart's function, of Wunderlich in introducing thermometry, had the effect to emphasize the value of functional diagnosis and this became the chief aim in medicine and pathology was forced into the background. But now came the epoch-making discoveries of Pasteur and Koch in determining the bacterial origin of disease and at last a solid foundation for a satisfactory basis of classification of disease was at hand in etiology. Moreover, from a practical viewpoint, finding the causation of disease is vastly more useful than all else for the purpose of prevention and treatment. Unfortunately, apart from the infectious diseases, our knowledge of etiology is still too limited to permit us to build a complete nosologic structure upon this restricted foundation.

Knowledge of etiology, the ultimate goal of medical endeavor, is to be attained through all advances in the various branches of the basic medical sciences. Nosography clarifies our conceptions of medicine but it not its paramount purpose. Clinical observation and experimentation still maintain their dominant place as chief factors in medical progress and in testing theoretical contributions. While our use of curative serum follows logically the discovery of the bacterial origin of disease, yet the equally marvelous therapeutic power of liver extract was not derived from any knowledge of the etiology of disease, but solely from animal experimentation in anemia of animals by Whipple, and clinical application of his results to pernicious anemia in man by Minot.

This book is very properly entitled "The Evolution of Clinical Medicine in Modern Times," which it describes by touching on the lives and works of the great clinicians and scientists who have been the cause of its progress. Great discrimination has been shown in selection of the essential matters and one unconsciously follows step by step the pathways blazed by the pioneers in medical art and science with increasing interest and admiration. WINSLOW

MODERN SURGERY. By J. Chalmers DaCosta, M.D., LL.D., F.A.C.S., and Samuel D. Gross, Professor of Surgery Jefferson Medical College, Philadelphia, etc. Assisted by Benjamin Lipshutz, M.D., F.A.C.S., Surgeon to the Mt. Sinai Hospital, etc. Tenth Edition, Revised and Reset. 1404 pp. with 1050 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $10.

Knowledge of surgery since this book first appeared in print has accumulated in great abundance. Newer methods, discoveries and ideas have arisen, and many have disappeared. Those surviving through trial are accepted. Happily the author of this volume has had such a broad and yet intimate grasp of the entire subject, that in edition after edition he has been able to eliminate from its pages that which has really been surplanted by something better, and to exclude the new "fads and fancies" of the period until their place in his book is obtained because of their proven place in surgical knowledge.

His frequent references to medical history throughout the book adds greatly to its interest, as well as to its instructiveness. Such sprinkling of historical data creates a broader view of the subject, and serves the reader with a link between the present and the past. Such a book is a safe guide for the neophyte, as well as a stimulus to the experienced. One following its teaching cannot go astray. It serves as a needed stabilizer in these times when embryonic ideas and methods receive such rapid and wide spread publicity. This volume should be at the surgeon's hand, not just in the library. TRUEBLOOD.

PHYSICS OF RADIOLOGY. For the Student of Roentgenology and Radium Therapy. By J. L. Weatherwax, M.A. Physicist, Philadelphia General Hospital, etc. With 126 Illustrations. 240 pp. $5. Paul B. Hoeber, Inc., New York, 1931.

The first chapter of the book is devoted to a brief yet comprehensive discourse on the principles of electricity as applied to roentgenology. Definitions of various electrical units are given. Electrical equipment used in the production of roentgen rays is described. The chapter is ended by evaluating and comparing the merits and demerits of valve tube rectification and mechanical rectification.

Many pertinent facts relating to the general subject are scattered throughout the text, making the volume very readable. For instanace, it is interesting to note that radium has an average life of 2500 years, radium emanations 5.6 days, while the energy of beta and gamma rays is spent in the fraction of an hour. It is stated that roentgen rays are invisible and are transmitted through space in the form of waves similar to the propagation of light and they travel at the same rate of speed as light waves. We learn that some of these waves are long and others short, so that the entire beam of roentgen rays is heterogeneous, but by infiltration through filters of aluminum and copper most of the long waves are absorbed by these metals and the beam then becomes homogeneous. Characteristic radiation, scattered radiation and corpuscular radiation are discussed.

A most intriguing phase of the book is the discourse on roentgen-ray spectra. There are illustrations showing them with and without filtration and the lesson learned in comparing them is most valuable. The book, in fact, has numerous illustrations, graphs and charts, all of which are helpful in clarifying the comparatively difficult subject of the physics of radiology. Considerable space is given to a discussion pertaining to the practical application of roentgen-ray and radium radiation in treatment. This book is particularly valuable because it deals with the fundamental principles of the subject considered and because the author's presentation is so clear and concise. KOENIG.

CLINICAL ALLERGY. Particularly Asthma and Hay Fever. Mechanism and Treatment. By Francis M. Rackemann, M.D., Physician to the Massachusetts General Hospital, Boston, etc. 617 pp. $10.50. The Macmillan Co., New York, 1931.

It is said that some books are to be digested, and it is certainly true of this work. However, it must be remembered that out of good digestion comes the vigor of life; and one certainly will be repaid, if he is interested in medicine, for the time spent in reviewing this excellent work. The preparation is most thorough and complete. The bibliographies are extensive and open up to one the wealth of the most valuable material available.

Part One, dealing with "The Phenomenon of Hypersensitiveness," opens for consideration the theories which no doubt will be involved in a good deal of progress in the next ten years. Part Two, dealing with the "Clinical Manifestations of Allergy," will be a joy to the practitioner confronted with this problem. The explanations and methods of procedure are both simple and thorough. Through the suggestions made and the methods outlined, one will

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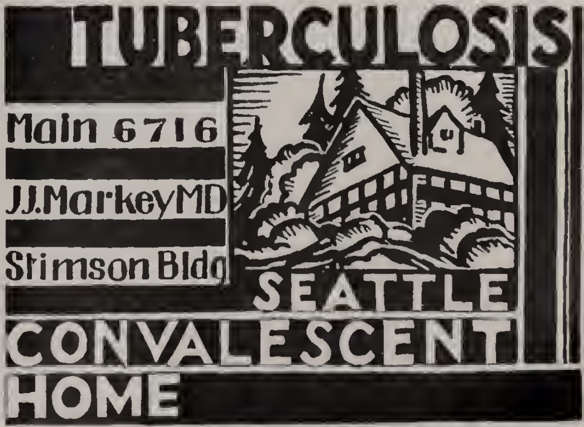

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find many channels for good progressive effort. One can recommend this work most highly. It permits a view of the activities of one who has applied himself most arduously and through the frankness of his expression opens up many new possibilities for those who wish to apply themselves. The author and his coworkers are to be complimented most highly. HOFRICHTER.

A PRACTICAL RADIO THERAPY. By Ira I. Kaplan, B.S., M.D., Director, Division of Cancer, Department of Hospitals, New York City; Attending Radiation Therapist, Bellevue Hospital. With a special chapter on Applied X-Ray Physics. By Carl B. Braestrup, B.Sc., P.E., Radiation Physicist, Division of Cancer, Department of Hospitals, Physicist to Mt. Sinai Hospital, New York City. 354 pp. with 227 illustrations. Philadelphia and London, W. B. Saunders Company, 1931. Cloth, $6.00.

The first portion of this book is devoted to the historical, theoretical and physical aspects of radiation therapy. It is very well written, in simple language and would be very helpful to any physician interested in the subject of therapy. The last half is devoted to specific instructions for treatment of practically all conditions amenable to radiation therapy both by radium, x-rays and endothermy. The book is unusually well illustrated with cases before and after treatment, the photographs being inscribed with exact details of treatment given and should prove a valuable addition to the library of any one doing radiation therapy. H. B. THOMPSON

THE CANDIRU. The Only Vertebrate Parasite of Man. By Eugene Willis Gudger, Ph.D. Bibliographer and Associate in Ichthyology, American Museum of Natural History, New York. With 18 illustrations. 120 pp. $1.50. Paul B. Hoeber, Inc., New York, 1930.

For many years the belief has existed in South America that the candiru, a fish of the Amazon river, enters the orifices of men and women while bathing, particularly attacking the urethra and vagina, if the individual urinates in the water. Accounts have been published of severe vaginal lacerations caused by the spines of these fish on attempts at their removal. Several writers mention amputation of the penis, infested by this fish, through fear of its entrance into the bladder and producing fatal inflammation. The author has made an intensive study of this problem. He reviews a mass of published testimony. Then follows a description of flesh-eating members of the catfish family, the most voracious of which is the piranha which devours animal flesh with the greatest avidity. While entering the South American streams the natives wear genital protections through fear of these carnivorous fishes. Though skepticism naturally exists as to the authenticity of these candiru tales, the author quotes several physicians who have actually extracted such a fish from the vagina and one surgeon who removed a specimen from the bladder. Therefore, it seems evident that there is truth in this weird and almost unbelievable rumor. This is an interesting booklet.

A SYNOPSIS OF MEDICINE. By Henry Letheby Tidy, M.A., M.D., B. Ch. (Oxon.), F.R.C.P. (Lond.) Physician to St. Thomas Hospital, etc. Fifth Edition, Revised and Enlarged. 1032 pp. $6.00. William Wood & Company, New York, 1930.

The purpose of this book is to provide a synopsis of such principles of medicine as are of importance at the present time. It is not a complete presentation of medical practice, but it presents in condensed space the essential facts of the diseases encountered by every practitioner. Symptoms, pathology and the essential facts of treatment are displayed for easy reference. The author does not discuss a great variety of treatments but briefly explains the most accepted and effective measures for the given condition. The hurried practitioner, who may have become rusty in certain lines, may be able hereby to renew his knowledge of essential details. Many alterations have been made in this edition and articles appear on diseases which have been identified as entities during the last few years. Unnecessary material has been eliminated so that this volume is up to date and can be depended upon for information. A full index is provided which will be found useful.

ANTE-NATAL CARE. Including the Abnormalities Associated with Pregnancy and a Section on Post-natal Care. By W. F. T. Haultain, O.B.E., M.C., B.A., M.B. (Camb.), F.R.C.S.E., M.C.O.G., Seinor Assistant Obstetric Physician and Late Medical Assistant to Ante-natal Department, Edinburgh Royal Maternity and Simpson Memorial Hospital, etc., and E. Chalmers Fahmy, M.B. (Edin.), F.R.C.E.S., M.R.C.P.E., M.C.O.G. Assistant Obstetrician Physician and Special Assistant to Ante-natal Department, Edinburgh Royal Maternity and Simpson Memorial Hospital, etc. Second Edition. 127 pp. $2.25. William Wood & Company, New York, 1931.

The authors state that there is no other book devoted especially to antenatal care. The universal exercise of such proper care will enormously reduce the incidence of abortion, stillbirths and eclampsia and will go a long way towards solving the problem of puerperal infection. The method of examination is that employed in the hospital with which the authors are connected. This is complete in all respects, the details of which are presented in this volume. There are chapters on diagnosis and hygiene of pregnancy. Special attention is given to pelvic measurements, while treatment covers contracted pelvis, albuminuria, eclampsia, nephritis and complications of pregnancy. There is an instructive chapter on postnatal care, including a variety of disturbances. This book should be of interest to every obstetrician.

NORTHWEST MEDICINE

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BRONCHOGENIC CARCINOMA

A PATHOLOGIC AND CLINICAL STUDY OF SIXTEEN INSTANCES *

FRANK R. MENNE, M.D., F.A.C.P.
MARR BISAILLON, M.D., F.A.C.P.
THOMAS D. ROBERTSON, M.D.
PORTLAND, ORE.

Instances of primary new growths in the lung are without question occurring with increased frequency, as exemplified by the frequent discussions in the recent medical literature.

Many of these accounts contain complete reviews of the literature, particularly those by Weller[1] and Miller and Jones.[2] The increased number of instances of bronchogenic carcinoma warrant the further assembly of data from different regions. Because of the difficulties in the differentiation of the types and a correlation of the clinical evidence with the underlying pathology, more specific analyses are of value. Then, too, it seems to us that studies in many different sections of the country may aid in settling the quesion as to the increased frequency.

About a year ago we began the study of five instances. Since that time eleven additional cases under our observation have come to autopsy.

GROSS PATHOLOGY

The examination of thoracic cavities of the individuals dying from bronchogenic carcinoma and its complications revealed variable conditions apparently dependent upon the age, extent, type and location of the lesion, as well as the remnants of coexisting disease. In twelve (75 per cent) there was evidence of bilateral chronic fibrous pleuritis, which as a general rule was most pronounced on the affected side. In many instances the bilateral distribution of interpleural fibrosis indicated the probable existence of this process prior to the carcinoma of the bronchus. In three cases there were acute extensions to the pleura with empyema cavity formations; in only one was a bloody fluid found in the pleural cavity at autopsy. In nine cases there was invasion of the mediastinum by metastases to the lymph nodes along with a marked perihilar fibrosis. In general a variable degree of retraction of the tissues of the mediastinum was found in the direction of the carcinoma, varying in extent with the peribronchial and pleural fibrosis. In one instance the structures of the mediastinum were crowded to the opposite side by the massive size of the tumor involvement. In only two cases were there marked compressions and distortions of the lumina of the trachea, bronchi and blood vessels by tumor nodules that encased them. In the majority of instances the heart was retracted towards the affected side, the pericardial sac being invaded in only four (25 per cent) cases. The right chambers were usually found in a state of considerable

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* From the Departments of Pathology and Medicine of the University of Oregon Medical School.

* Read before the Fifty-sixth Annual Meeting of Oregon State Medical Society, Portland, Ore., Sept. 17-19, 1930.

[1] Weller, C. V.: The Pathology of Primary Carcinoma of the Lung. Arch. Path., 7:478-519, March, 1929.

[2] Miller, J. A. and Jones, O. R.: Primary Carcinoma of the Lung. Tubercle, 11:501-506, 1930.

Table I

PATHOLOGIC GROUPING OF BRONCHOGENIC CARCINOMA AND ASSOCIATED CONDITIONS

GROUP I

Autopsy Case No.	Location	Type	Associated Pathology	Metastasis
366–8–30 Case 1	Left Main Bronchus	Hilar Nodular	Pneumonoconiosis—Bullous Emphysema—Purulent Bronchiectasis of Left Upper Lobe—Chondroma Fibrous Pleuritis.	None
345–8–30 Case 2	Left Lower Lobe Primary Bronchus	Hilar Nodular	Stenosis of Bronchus—Fibrosis—Purulent Bronchitis—Broncho pneumonia—Fibrous Pleuritis—Carcinoma of Prostate—Primary.	Regional Lymph Nodes—Left Pleura—Liver.
89–12–29 Case 3	Right Lung Primary Bronchus	Hilar Nodular	Stenosis of Bronchus—Bronchiectasis—Atelectasis—Purulent Bronchitis—Fibrosis—Fibrous Pleuritis, Pericarditis, Perihepatitis, Perigastritis and Perisplenitis.	Regional Lymph Nodes.
57–11–29 Case 4	Left Lung Primary Bronchus	Hilar Nodular	Bronchial Stenosis—Fibrosis—Bronchiectasis Tuberculosis Fibrocaseous, Cavernous and Miliary (Both Lungs).	Regional Lymph Nodes.
288–7–30 Case 5	Right Lung Primary Bronchus	Hilar Nodular	Stenosis of Bronchus—Bronchiectasis—Tracheo-Bronchitis—Bronchopneumonia—Cavitation in Right Lung—Hemorrhage.	Tracheo-bronchial and Periaortic Lymph Nodes—Left Adrenal—Pancreas.
18–1–30 Case 6	Right Lung Primary Bronchus	Hilar Nodular—Massive	Obstruction of Bronchus—Bronchiectasis—Atelectasis—Chronic Fibrous Pleuritis—Hypertrophy of Right Side of Heart.	Periaortic Lymph Nodes—Suprarenal Glands—Spleen—Liver—Kidneys.
190–4–30 Case 7	Left Lung Secondary Bronchus	Hilar Nodular	Obstruction of Bronchus—Bronchiectasis—Pneumonia—Pulmonary Abcess—Fibrous Pleuritis.	Mediastinal, Cervical and Periaortic Lymph Nodes—Liver—Left Kidney—Tongue—Spleen—Adrenals—Subcutaneous Tissue.
191–4–30 Case 8	Left Lung Primary Bronchus	Hilar Nodular	Bronchial Stenosis — Ulceration — Empyema — Bronchiectasis—Pulmonary Gangrene—Serofibrinous Pericarditis.	Mediastinal and Tracheobronchial Lymph Nodes.
20031 Case 9	Left Lung Secondary Bronchus	Hilar Nodular—Massive	Stenosis—Bronchiectasis—Fibrocaseous Tuberculosis—Purulent Bronchitis.	Pericardium—Regional Lymph Nodes.
382–9–30 Case 10	Left Lung	Hilar Nodular	Pulmonary Suppuration—Bronchiectasis.	Mediastinal and Prevertebral Lymph Nodes—Right Lung.

GROUP II

Autopsy Case No.	Location	Type	Associated Pathology	Metastasis
20623 Case 11	Left Lung Secondary Bronchus	Diffuse Necrotic	Stenosis — Atelectasis — Purulent Bronchitis — Exophthalmos — Parenchymatous Hyperplasia of Thyroid.	Hilus Lymph Nodes — Pericardial Sac—Right Lung—Periaortic, Gastric and Biliary Lymph Nodes.
9110 Case 12	Left Lung Secondary Bronchus	Diffuse Necrotic	Bronchiectasis — Suppurative Pneumonitis — Fibrinous Pleuritis—Mucopurulent Bronchitis Thrombosis of right External Iliac Vein.	Tracheobronchial Lymph Nodes—Liver—Suprarenal Glands—Right Kidney—Skeletal Musculat.
36–1–30 Case 13	Right Lung Secondary Bronchus	Diffuse Necrotic	Pneumonia—Pulmonary Gangrene—Bronchiectasis — Purulent Bronchitis — Serofibrinous Pleuritis and Pericarditis.	Tracheobronchial and Mediastinal Lymph Nodes—Left Lung.
24984 Case 14	Right Lung Secondary Bronchus	Diffuse Necrotic	Peribronchitis—Pneumonitis—Purulent Bronchitis—Diffuse Fibrosis—Fibrous Pleuritis—Tuberculous Cavity of Right Lung—Pyelonephrosis (Right).	Regional, Axillary and Deep Cervical Lymph Nodes, Pancreas.
20464 Case 15	Left Lung Secondary Bronchus	Diffuse Necrotic	Fibrous Perihepatitis and Splenitis —Coagulation—Necrosis of Lung—Suppuration—Atelectasis—Hemorrhage—Sacular Aneurysm of Ascending Aorta.	Regional and Mediastinal Lymph Nodes, Pleura and Liver.
357–8–30 Case 16	Left Lung—Secondary or Tertiary Division of Bronchus.	Diffuse Necrotic.	Pulmonary Suppuration—Purulent Bronchitis—Serosanguineous Pleuritis—Terminal Bronchopneumonia.	Regional Lymph Nodes.

dilatation, often with marked hypertrophy of the right ventricle.

A study of the macroscopic appearance of the lungs involved in the primary bronchogenic carcinomas considered in this report reveals two major groups. In one of these there is a maximum concentration of the nodules at the hilus with a tendency to mediastinal invasion (hilar nodular type). The other type is characterized by a diffuse dissemination into the parenchyma of the lung (diffuse necrotic type) with a minimum concentration at the hilus (see Table 1). Ten (62.5 per cent) were in the first group, while six (37.5 per cent) were in the second group. Eleven of the sixteen were in the left lung; five were in the right, which ratio is somewhat at variance with some of the reports in the literature, as in the earlier accounts the right lung appeared to be the site of predilection, although more recently the occurrence is found to be about equally divided.

Among the associated disturbances pneumonoconiosis was not particularly prominent. In only one instance did it assume noteworthy prominence. In two cases there were fibrocaseous tuberculous processes (see cases 4 and 9). While cancer cells mingled with the tuberculosis, the cytologic evidence was such as to indicate that carcinoma cell invasion occurred secondarily and was not initiated by the tuberculous disease of the lung. In one instance manifest tuberculosis was present in the contralateral lung.

In the main, the associated pathologic conditions are subject to great variations, depending upon the type. The two groups which we have designated as hilar nodular and diffuse necrotic types, as a rule, produce two distinctive composite pathologic patterns.

MICROSCOPIC PATHOLOGY

The histologic study of sections taken from various parts of the lung invaded by the carcinomatous process indicates a greatly varied pathology, as far as the types of cells, their pattern arrangements and associate changes are concerned. Those who believe that the classification of carcinoma on the basis of the gross characteristics is difficult because of lack of distinctness of character, maintain that the cell types seen in microscopic studies offer a more definite means of distinguishing the forms of bronchogenic malignancies. Weller divided the instances studied by him into "undifferentiated cell carcinoma, squamous cell carcinoma, and cylindrical cell carcinoma." Maxwell[3] speaks of these tumors as being composed of columnar cells with a tendency to undergo squamous cell metaplasia or small oval cells arising from the basal cell layers of bronchial mucosa. Boyd[4] submits an histologic classification, in which he emphasizes (1) anaplastic or undifferentiated, consisting of small round cells, spindle cells (like sarcoma) and oat cells, (2) squamous cell, cornifying or noncornifying, the latter form being the more frequent. In addition he includes two other groups, designated as medullary and adenocarcinoma respectively.

Our studies corroborate the conclusions of Weller, namely, that there is a confusion of cell types so undifferentiated that their specific origin is not readily determined. An analysis of the cell types of the sixteen cases, forming the basis of this report, revealed that in four instances there were accumulations of squamous cells with keratinization usually near the hilus. This cell formation is most common in the hilar nodular group. Keratinization apparently occurs when there is sufficient space to allow for freedom of growth in the earlier stages of malignancy. A somewhat greater number (7) exhibited stratification without keratinization. In such instances the cells appeared to be growing more rapidly. Mitotic figures were more numerous and a larger number of so-called polyhedral cells were present. Such cell masses vary in size, usually depending upon the amount of fibrosis. The pattern is often that of a so-called medullary or scirrhomedullary formation. Careful study of different areas will as a rule disclose a basic tendency to stratification in all instances.

In practically all of the cases certain areas disclose rather large intermediate polyhedral cells. In five instances the hypertrophy of such cells was sufficient to give rise to large mononuclear giant cells. Cells with both large and small spindle shaped nuclei were present in thirteen of the carcinomas. In two of these large and in one small, spindle cells predominated to the extent of producing a process simulating sarcoma. In only two of the cases did the acinar arrangement of carcinoma cells exist to the extent of classifying the lesion as an adenocarcinoma. In still another there was a definite papillary formation, in which the columnar cell type and the extensive mucoid accumulation seemed to point to a papillary carcinoma, probably originating in the submucous glands.

In fifteen of the instances there was acinous formation in variable degrees. This arrangement of cells was about the periphery of spaces juxtaposed to the vascular supportive stroma. It is our opinion that these constitute pseudoacini. The appelation of adenocarcinoma to these types is probably erroneous. In none of our cases were there evidences of alveolar origin. Massive filling of the atria in certain types resulting from intrabronchial, peribronchial and vascular extension with wide disseminated nodule formation cannot be interpreted as originating from atrial epithelium.

It would seem to us that the evidence accumulated in our studies indicates that the vast majority of primary bronchogenic carcinomas originate from the primary and secondary divisions of the bronchi, in the zone of bronchial mucosa where the stratification begins to taper off into a single layer structure, which is in keeping with the well known tendency for the frequency of carcinomatous origin in areas of transition of epithelial structure.

Our studies have also led us to take issue with those (Ewing, Kirkland and others) who believe that there exists a primary carcinoma arising from the atrial lining cells. Such so-called parenchymatous types are probably based upon erroneous interpretations of widespread disseminations (a matter of lung lymphatics and the site of origin) seen in certain of the diffuse necrotic types. One must certainly hesitate in considering the atrial lining cells as sources of carcinoma, when no specific evidence exists of tumors arising here, and especially when it is still a matter of controversy among anatomists as to whether such lining cells are of *epithelial* or *endothelial* origin. For these reasons we see no basis for the utilization of the term "parenchymal" as a pathologic designation in the classification of primary carcinomas of the lung.

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[3] Maxwell, J.: Primary Malignant Intrathoracic Tumours. J. Path. and Bact., 33:233-240, 1930.

[4] Boyd, W.: Notes on the Pathology of Primary Carcinoma of the Lung. Can. Med. Assoc. Jour., 23:210-217, Aug., 1930.

There is present, then, in sections of most bronchogenic carcinomas only cell types that might be reasonably expected to be seen arising from stratified epithelium. We are impressed with the fact that these tumors are somewhat analagous to those occurring in the cervix uteri. Here Martzloff[5] characterized certain cell types from a study of biopsy material. Upon the basis of cell differentiation he recognized varying degrees of malignancy. In a later study he (Martzloff[6]) found in different parts of the same tumors various types of cells represented. There is this difference, however, in the lungs, namely, the existence of abundant lymphatics, blood vessels, bronchi and atria, all of which may serve as passages and guide the distribution and arrangement of cell pattern and structural design. The anaplasia of the cell emphasized by Boyd and others seems to be the most striking observation in the cytology of lung carcinoma.

In view of the complex character of the cell structure we cannot agree with Karsner and Saphir[7] and others that the classification of bronchogenic carcinoma on the basis of its cytology is most satisfactory. It certainly is not as definite as the gross division into hilar nodular and diffuse necrotic types, as defined by us in our studies. While one may plausibly assume that such carcinomas originate in either the bronchial mucosa or submucous glands and that certain cytologic types and patterns predominate, it is confusing and misleading to ascribe to each cell entity a specific type of bronchogenic carcinoma. As has been pointed out, it seems to us that anaplasia and metaplasia of the bronchial mucosa in the carcinoma area may yield such a pronounced cellular variation further augmented by normal and abnormally associated changes in the lung, that such typing is exceedingly difficult and for the most part not dependably accurate.

PATHOGENESIS

The hilar nodular type appears to arise largely from the mucosa of the primary bronchi. A number of initial sites were strikingly about 2.5 cm. from the carina trachea (see case 7). A study of such early malignancies as well as others indicate that the sequence of changes occurring in the development of this type of carcinoma is as follows: (1) Hypertrophy, hyperplasia and metaplasia of the epithelium of the bronchus, (2) incomplete occlusion of the lumen, (3) extension through the bronchial wall accompanied by peribronchial wandering cell infiltration and fibrosis, (4) extension into the peribronchial and perivascular lymphatics, (5) extension into the hilus and tracheobronchial lymph nodes, (6) limited or slow extension into the lung with peribronchial fibrosis, thickening of the bronchial walls, atelectasis, coagulation necrosis and secondary infectious processes appearing late in the development.

On the other hand, the pathogensis of the diffuse necrotic type appears to be altered by virtue of the fact that the initial lesion begins deeper in the lung structure (secondary or tertiary bronchi) or for certain anatomic reasons as well as those of rate of growth it soon spreads more deeply. Such direction of the dissemination appears to be in part due to the early and more complete occlusion of the smaller bronchi by the new growth. This second type is, therefore, seemingly characterized by (1) bronchial stenosis due to the tumor growth and plugs of debris containing detached epithelial cells, wandering cells, inspissated mucus, bacteria, red blood cells and fibrin, (2) peribronchial and peri-

Fig. 1. Case 1 (366-8-30). Photograph of the surface of the lung made by sectioning, illustrating A, the roughening of the mucosa, the site of an early lesion of bronchogenic carcinoma. Note the variation in the position in the left main bronchus in which the carcinoma occurs. Also, note the fibrosis and carcinomatous invasion paralleling the bronchus.

Fig. 2. Case 1 (366-8-30). Photograph illustrating the limited extension and associated fibrosis in the hilus of the left lung. Section made through the area seen on the inside of the left bronchus.

Fig. 3. Case 1 (366-8-30). Photomicrograph illustrating the nature of the invasion and the massive collections of cells in relationship to the stroma.

Fig. 4. Case 2 (345-8-30). Patient H. Note high standing diaphragm on left, increased obliquity and narrowing of ribs and ill-defined shadow of increased density in the left hemithorax with characteristic ill-defined blurred border.

Fig. 5. Case 2 (345-8-30). Photograph illustrating the character of the growth at the hilus with extension into the parenchyma of the lung. Note the character of retraction in the direction of the hilus, peribronchial fibrosis, and the grossly evident spread along the bronchus.

Fig. 6. Case 2 (345-8-30). Photomicrograph illustrating the cell type and the marked surrounding fibrosis with limited round cell infiltration.

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[5] Martzloff, K. H.: Epidermoid Carcinoma of the Cervix Uteri. Am. J. Obst. and Gyn., 16:578, Oct., 1928.

[6] Martzloff, K. H.: Cancer of Cervix Uteri. N.W. Med., 28:74-81, Feb., 1929.

[7] Karsner, H. T. and Saphir, Otto: Small Cell Carcinomas of the Lung. Am. Jour. Path., 6:553-560, 1930.

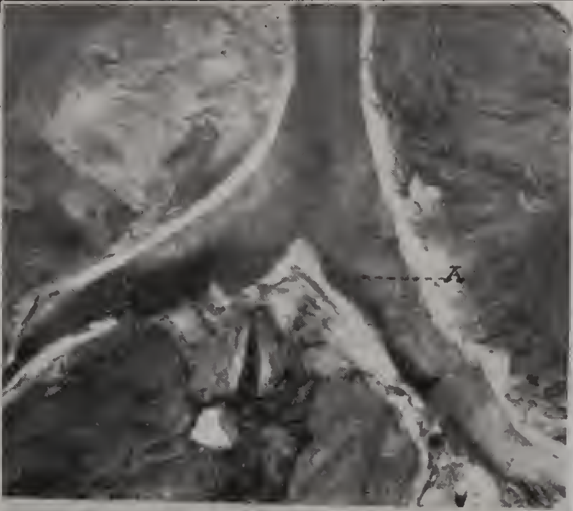

Fig. 1 Case 1

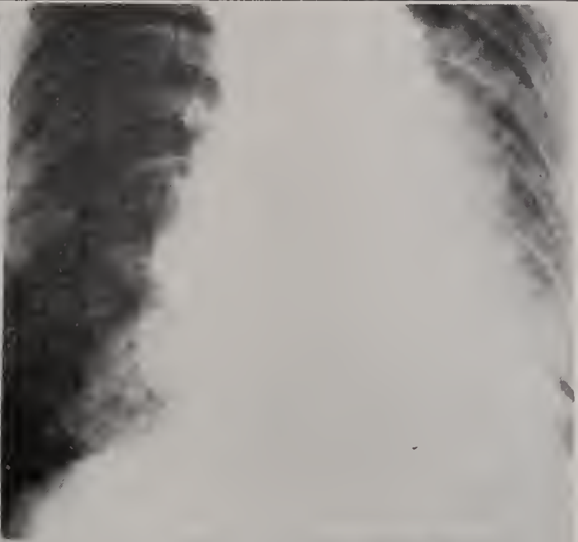

Fig. 4 Case 2

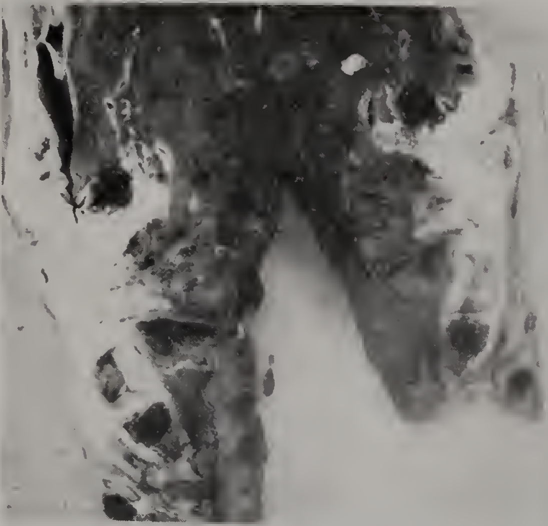

Fig. 2 Case 1

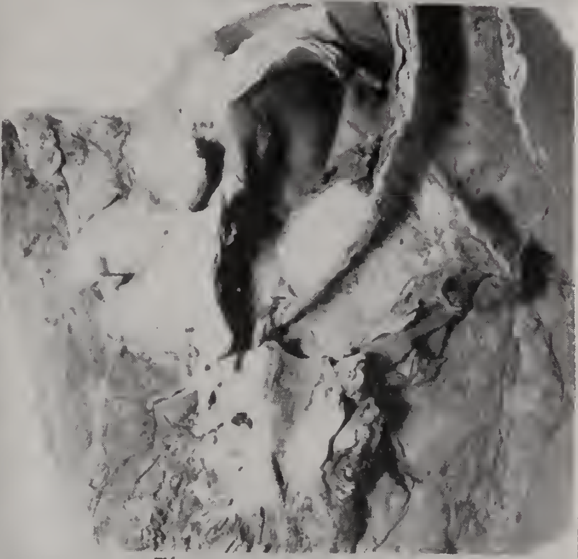

Fig. 5 Case 2

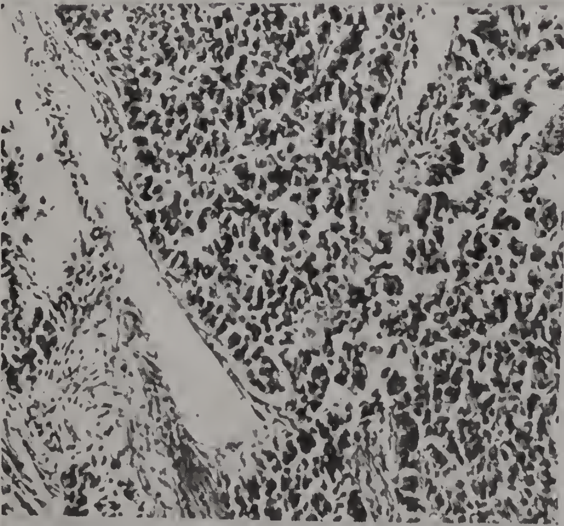

Fig. 3 Case 1

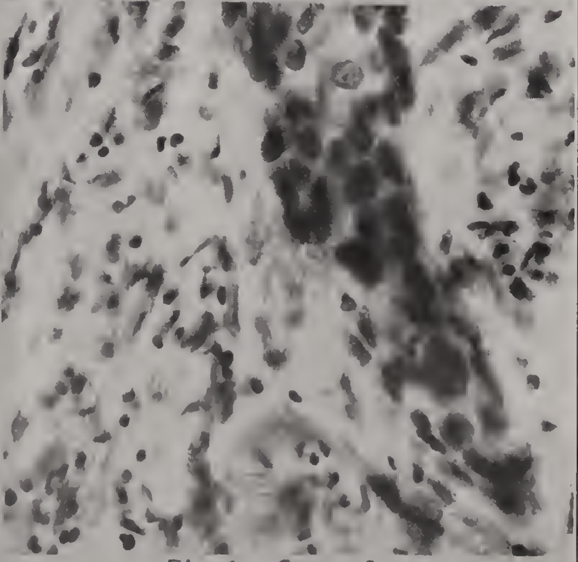

Fig. 6 Case 2

arterial lymphatic extension, (3) intrapulmonary lymphatic stasis, (4) engorgement and thrombosis of blood vessels, (5) edema, (6) secondary infection, (7) coagulation and liquefaction necrosis, (8) pneumonia, (9) miliary abscess formation, (10) extensive small tumor nodule formation (miliary carcinosis), (11) peribronchial and intrapulmonary fibrosis, (12) extension to the pleura with exudate formation and subsequent fibrosis. The extent to which several or all of these changes may be present varies in the different lungs, many of the secondary changes being undoubtedly due to the type of tumor cell, the rapidity of growth and the exposure of the individual lungs to different pathogenic bacteria. Bronchiectasis so frequently referred to in the literature probably does not occur in its true form, although terminal peribronchial fibrosis with widely dilated bronchi that have thickened walls are observed, but there is very little evidence of real pocket-like alterations of the bronchi lumina, as is seen in true bronchiectasis.

In most of the lungs studied the process involved one lobe or a part of the lobe with extensions into contiguous portions of the adjacent lobes. The concomitant secondary changes not infrequently result in the whole lung being infiltrated.

CLINICAL STUDY

Age. In our series of sixteen cases of primary bronchogenic carcinoma, the ages ranged from 42 years to 65, the highest incidence occurring at the age of 50 and 53 years. Bonner[8] states that the occurrence is greatest in the sixth decade. Homan,[9] in an analysis of sixty-one cases, found the highest incidence in the ages of 56 to 60 years. Goltz gives a wider age range, the maximum number occurring in the period from 45 to 75 years, the youngest at 17 and the oldest at 77. Weller found the peak of the curve of age incidence to be from 56 to 60 years. At least we can say that the great majority of the cases of carcinoma of the lung occur at the "cancer age," with an occasional one seen towards the two extremes of life in about the same relative frequency as cancer of the stomach, uterus and breast.

Sex. All of our cases with the exception of one were of the male sex. Other reports show a higher incidence in males than in females with varying ratios. Boyd reported fourteen cases, all of which were men. Homan reports in his analysis of sixty-one cases a ratio of males and females of three to one. An analysis of any large series of primary bronchogenic carcinoma will reveal a predominance in males, and our series is in accord with this fact.

Occupation. The histories of the cases studied by us show no relationship of the incidence to any one occupation.

Etiology. In all discussions of the etiology of cancer, the most accepted factor is that of chronic irritation. Of the irritative causes in relation to bronchogenic carcinoma, the following have been emphasized: external mechanical trauma; tuberculosis; acute and chronic respiratory conditions such as influenza, chronic bronchitis, bronchiectasis and fibroid pneumonia; pneumokoniosis; chemical irritation such as commercial gasses and war gasses; tobacco; dust containing tar and heavy oils of the road. Any of these processes are productive of long continued reparative reepithelization resulting in altered anatomic pattern, and may, therefore, be factors in the production of primary bronchogenic carcinoma.

SYMPTOMS AND SIGNS ANALYZED ON THE BASIS OF THE PATHOLOGY

It is unnecessary to state that the clinical symptoms and especially the physical signs will entirely depend upon the type of new growth, its size, location, stage of development and upon the state of the surrounding lung tissue.

While bronchogenic carcinoma may produce a widely variable symptomatology, nevertheless the symptoms will be identified with two main clinical groups: (1) Those wherein the symptoms are chiefly related to the lungs, (2) those whose symptoms are produced at first by the metastases, particularly to the pleura (pain or exudate), brain, etc. The hilar nodular type is more frequently associated, in the beginning, with those symptoms referable to the lungs, while the diffuse necrotic group

Fig. 7. Case 3 (89-12-29). Patient C. Right upper lobe bronchus carcinoma. Large shadow of increased density sharply limited to the right upper lobe, being caused by absorption atelectasis distal to the bronchus carcinoma obstructing the lumen near the hilus.

Fig. 8. Case 3 (89-12-29). Photograph illustrating the nodular character of the growth with upward extension along the trachea. Note the fibrosis in the area of obstruction.

Fig. 9. Case 3 (89-12-29). Photomicrograph illustrating the site of origin of the carcinoma with extension into the peribronchial lymphatics and tissue spaces.

Fig. 10. Case 4 (57-11-29). Diffuse type bronchus carcinoma with cavity formation, following necrosis and infections. Tubercle bacilli present in the sputum.

Fig. 11. Case 4 (57-11-29). Photograph of the gross changes produced at the hilus by the carcinoma. Changes not extensive. Note the evidence of tuberculosis at the apex in which carcinomatous cell extension is also found. The small greyish nodules seen throughout the lung parenchyma are in part tubercles and in part carcinomatous involvement. A, tuberculous cavity in the apex. B, carcinomatous nodules.

Fig. 12. Case 4 (57-11-29). Photomicrograph illustrating the association of a granulomatous process with giant cell formation and the invasion of tumor cells.

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[8] Bonner, L. A.: Primary Lung Tumor. J. A. M. A., 94:1044-1049, 1930.

[9] Homan, E.: Lungenkrebs und Lungensarkom. Ergebn. d. Inn. Med. u. Kinderh., 35:206-254, 1929.

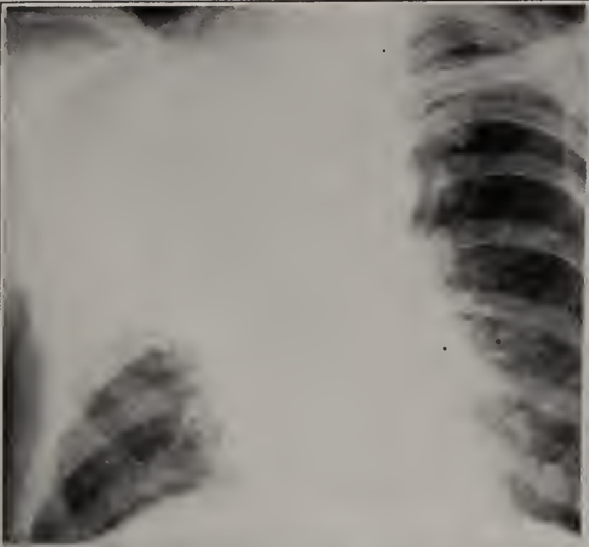

Fig. 7 Case 3

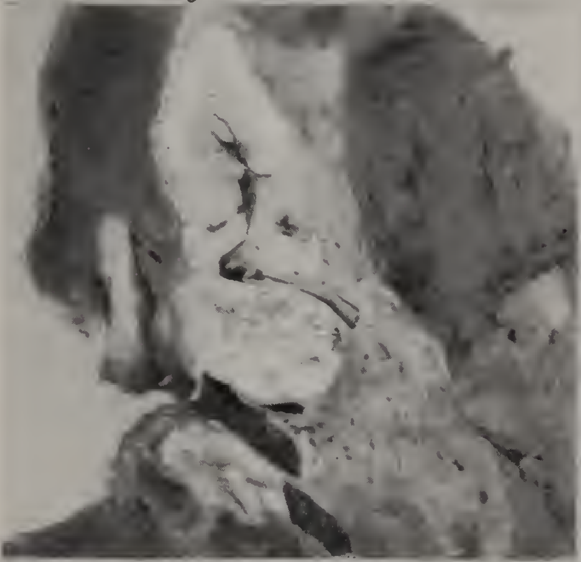

Fig. 8 Case 3

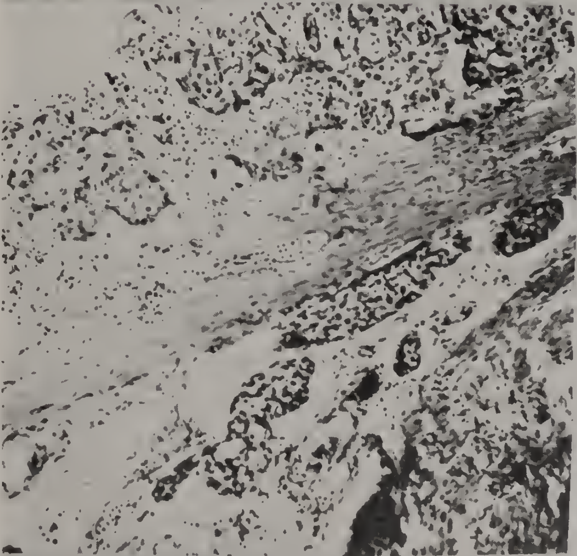

Fig. 9 Case 3

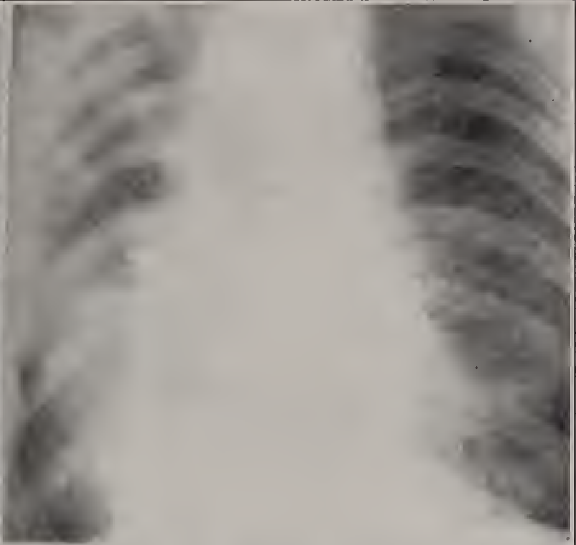

Fig. 10 Case 4

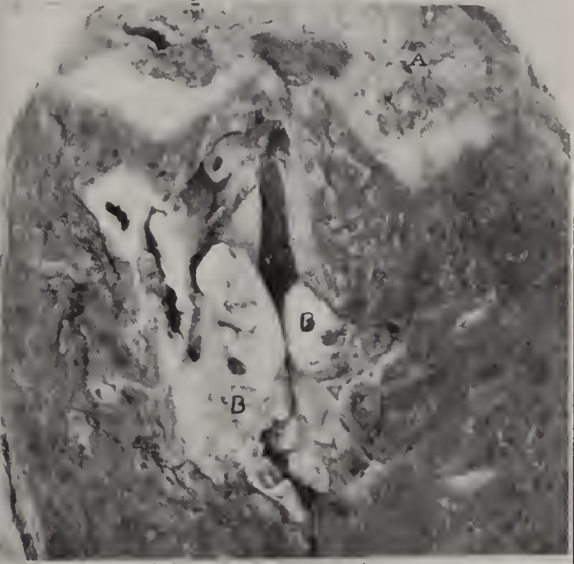

Fig. 11 Case 4

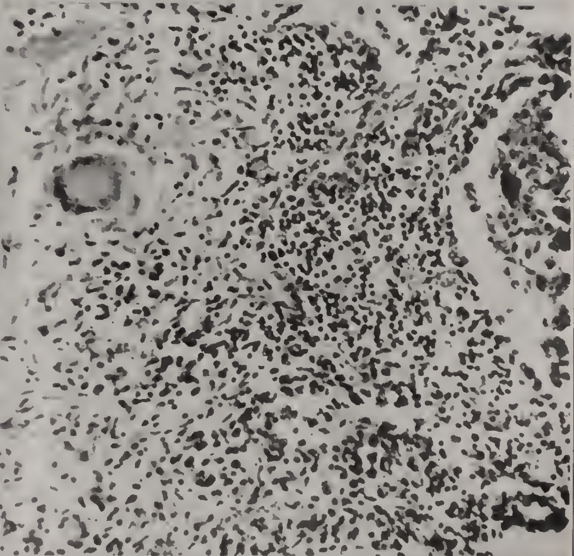

Fig. 12 Case 4

are more often identified with those symptoms related to the pleura, being later characterized by symptoms associated with the necrotic processes (lung abscess, empyema, etc.). The symptoms of necrotic lung abscess, pulmonary suppuration and empyema, induced by necrosis, may appear in the late stages but nevertheless remain obscure and misleading, and it may be difficult at this time to determine whether or not one may be dealing with the ordinary pyogenic forms of pulmonary abscess or empyema.

The mode of onset in either group, in the majority of instances, is insidious, but manifest symptoms causing the patient to present himself for examination may be associated at times with an acute violent respiratory symptom-complex. The fact that most cases are ushered into manifest symptoms by a gradual onset is to be expected, as intrabronchial and peribronchial extension by way of the lymphatics takes place slowly, while a sudden onset of symptoms is usually produced by complications, such as the obstruction of a bronchus by mucus, debris or blood, or by an associated bronchitis, acute pneumonia, pleurisy or empyema.

Cough and expectoration. Cough was present in all of the sixteen cases analyzed. It begins first as a dry cough and progresses to slight expectoration which later, in the majority of cases, becomes blood-tinged. A frank hemoptysis is unusual but may occur in the later stages, when there is considerable necrosis of the new growth with erosion of a blood vessel of appreciable size. The persistent blood-streaked sputum can be explained by the fact that the bronchial mucosal surface, at the site of the new growth, is constantly undergoing necrosis and small blood vessels and capillaries are being laid open. Hemorrhage and blood-tinged sputum are more frequent in the diffuse necrotic type, as necrosis and destruction of tissue is more common in this group than in the hilar nodular type. The character of the sputum has been described by some as having the appearance of raspberry juice, but was not present in any case in our series. One feature of the cough to be emphasized is that it is persistent. With recurrent laryngeal paralysis it assumes a peculiar resonant quality, that of a "brassy cough" or the "goose cough" resembling the aneurysmal cough, and at times is associated with diplophonia or aphonia. It should be further emphasized that persistent cough, and blood-tinged sputum, in an individual in the carcinoma age with obscure chest symptoms and signs, is as suggestive of bronchogenic carcinoma as a frank hemoptysis in a younger individual is indicative of pulmonary tuberculosis.

Dyspnea. This was practically always present and persistent at some stage of the disease in all of the diffuse necrotic type and in five of the hilar nodular type. In many cases this appears early, and once present, is persistent and progressive, sometimes being entirely out of proportion to the size and extent of the growth, the obvious causes being a decrease in the amount of lung tissue available for aeration of the blood, and impairment of the mobility of the involved hemithorax. This is primarily due to bronchostenosis in large anatomic units and from peribronchial and intrabronchial lymphogenous extension of the new growth, causing atelectasis. The more proximal the location of the tumor in the primary bronchus, the earlier the appearance and the greater the degree of the dyspnea. The dyspnea of the hilar nodular type is associated with intrabronchial stenosis as a result of the presence of the tumor within the bronchial lumen, while dyspnea of the diffuse necrotic type has additional factors of stenosis from extrabronchial pressure, associated with peribronchial lymphogenous metastases involving the lung parenchyma, as well as the pneumonic consolidations, abscess formation, pleural effusion and empyema.

Cyanosis. Much that has been said in regard to shortness of breath applies to this sign, with the exception that cyanosis usually appears later, but once manifest, is persistent and progressive, becoming pronounced with venous obstruction, terminal pneumonia or dilatation of the right heart.

Pain. In eight of our cases (50 per cent, 25 per cent hilar nodular and 25 per cent diffuse necrotic) pain was charted and was probably present in the others in varying degree as distress, discomfort or oppression in the chest at some stage of the dis-

Fig. 13. Case 5 (288-7-30). Carcinoma of the right main bronchus obstructing the lumen with resulting necrosis of the right lower lobe and cavity formation. Note deviation of the trachea and mediastinum to the right with uncovering of the left hilus and marked emphysema of the left lung.

Fig. 14. Case 5 (288-7-30). Photograph illustrating the character of the growth at the hilus of the lung. Note the destruction and abscess formation near the base. A, abscess cavity. B, carcinoma.

Fig. 15. Case 5 (288-7-30). Photomicrograph illustrating the character of the growth, the cell type and fibrosis.

Fig. 16. Case 6 (18-1-30). Massive primary carcinoma of the right upper lobe bronchus with etxension to the middle lobe. Note characteristic high standing diaphragm on the right side.

Fig. 17. Case 6 (18-1-30). Photograph illustrating the massive nodular character of the new growth at the hilus with a minimum of diffusion, marked bronchial thickening, diffused fibrosis of upper lobe of right lung with fibrous pleuritis.

Fig. 18. Case 6 (18-1-30). Photomicrograph illustrating the pavement-like arrangement of the cells which are of the large polyhedral type. Very little stroma is present.

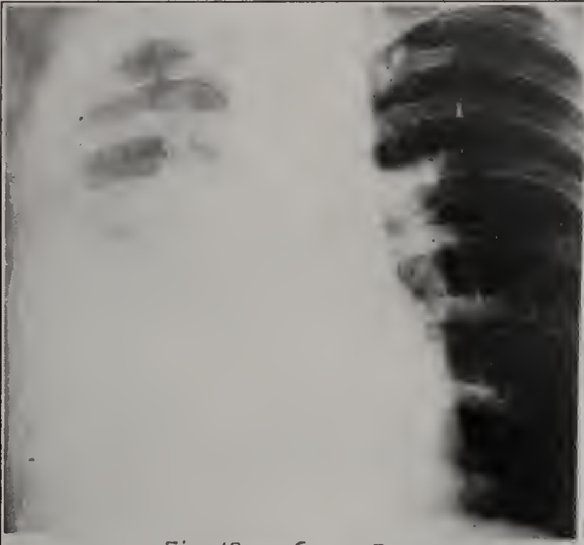

Fig. 13 Case 5

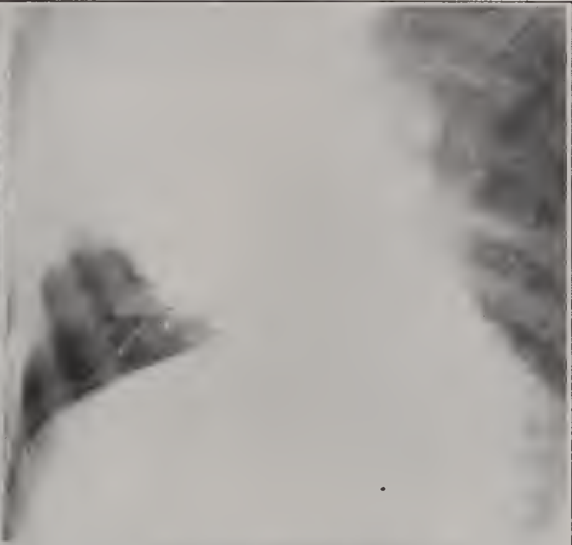

Fig. 16 Case 6

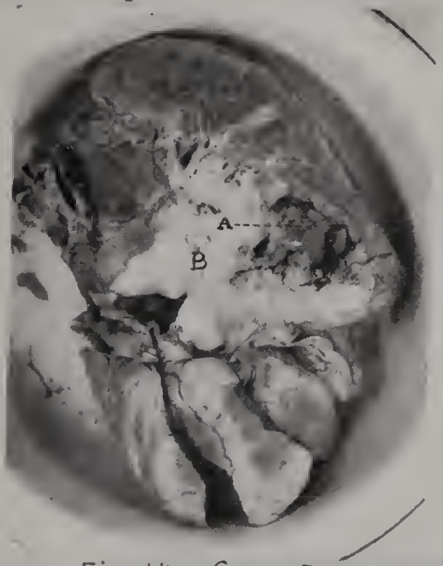

Fig. 14 Case 5

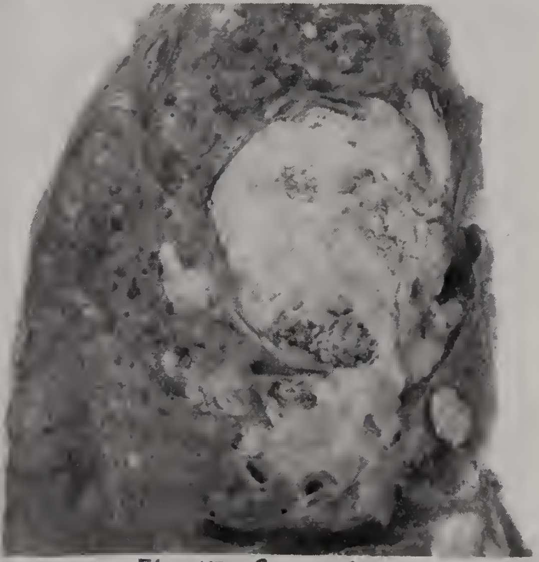

Fig. 17 Case 6

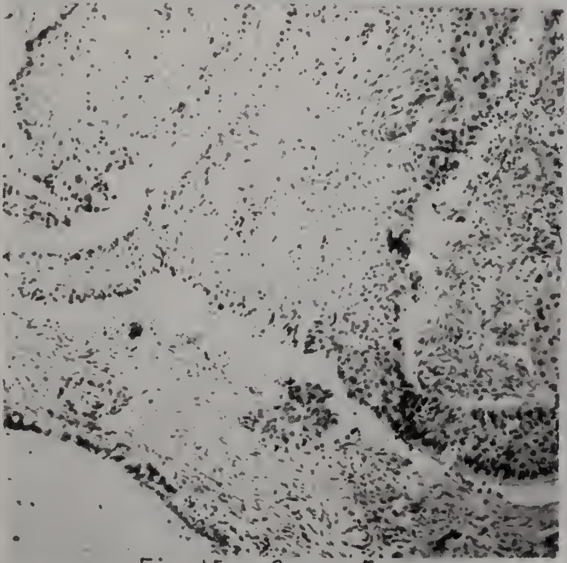

Fig 15 Case 5

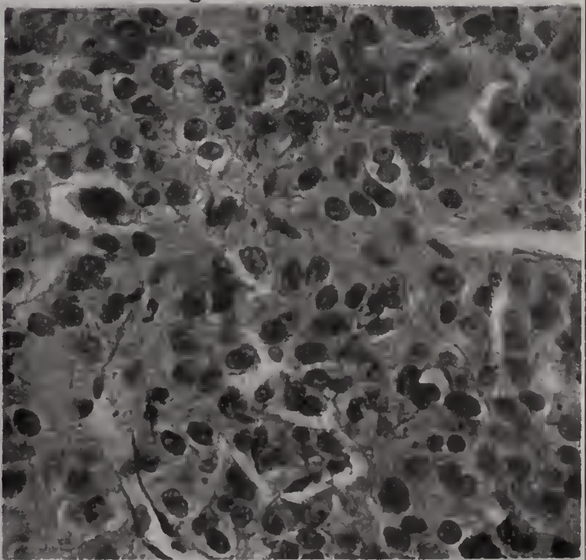

Fig. 18 Case 6

ease, but was not recorded. Pain in the chest is usually present sooner or later, and will vary in character and distribution, depending upon the size and location of the tumor and its metastases. In general there are three main types of thoracic pain associated with bronchogenic carcinoma. The first is a dull, deep-seated, centrally located pain, or distress beneath the sternum. This is no doubt due to pressure upon the mediastinal nerve plexuses, caused by the primary newgrowth and its metastases to the lymph nodes in the mediastinum. This type of pain is more common in the hilar nodular group but is less apt to be present in those tumors (diffuse necrotic type) which arise towards the periphery of the bronchial tree, as mediastinal pressure and lymph node metastases occur late in the latter group. In one of our cases the distress was described as "tightness beneath the sternum." The second type of pain is due to actual pleural metastases impinging upon the sensory pain endings of the parietal pleura, and has all of the characteristics of the pain associated with a fibrinous pleuritis. The third type of pain appears if the process involves the intercostal nerves, which pain has the characteristics of a root pain or an intercostal neuritis, being much more constant, severe, and boring over wide areas of nerve distribution.

METASTASES

Metastases to the pleura, by way of the bronchial and peribronchial lymphatics, occur early in those tumors (diffuse necrotic type) which arise towards the periphery of the bronchial tree and have a tendency to invade the outer third of the lung parenchyma, the lymphatics of which drain toward the visceral pleura. Hence, it is apparent that pleural pain is more common and appears earlier in the diffuse necrotic type than in those tumors arising more proximally (hilar nodular type). The rate and the extension of metastases, however, depend upon the degree of anaplasia (lack of differentiation) of the primary newgrowth, which is in accord with Broder's classification of the degree of malignancy of all carcinomas.

There are numerous signs and symptoms which are caused by intrathoracic or extrathoracic metastases. Hoarseness, diplophonia or aphonia are caused by metastases pressing upon one recurrent laryngeal nerve, more frequently the left. A laryngoscopic examination may reveal a paralysis of one or both vocal cords. A most suggestive sign of primary carcinoma of the lung is a recurrent laryngeal paralysis, associated with a sanguineous pleural exudate of the same side in an individual past middle age.

Large mediastinal metastatic nodes in the region of the superior aperture of the thoracic cavity may press upon the vessels here, causing engorgement of the veins of the neck, as well as edema and cyanosis of the head and neck. Inequality of the pupils can be accounted for by involvement of the sympathetic chain within the upper thorax or neck, which supplies the dilator of the iris. Pressure atrophy of this sympathetic supply results in constriction of the pupil, and irritation by the newgrowth may result in some dilatation.

Likewise pressure by metastatic nodules impinging upon the brachial plexus or the nerves originating from it may produce neuritic pain in the arm. Various muscles may be paralyzed by pressure atrophy of motor nerves. Abdominal pain occurs sometimes with abdominal metastases with the various complications resulting from their presence. Metastases to the adrenal gland are not infrequent, occurring in four instances in our series, one case (case 6) developing an Addisonian syndrome. This syndrome is, of course, unusual, as death generally occurs before destruction of the adrenal cortex is sufficient to give rise to this clinical entity. There may be inequality of the radial pulses caused by metastatic nodules pressing on one of the subclavian or axillary arteries. Metastases may also occur in any part of the bony skeleton, and when present may give rise to severe pain. Although especially sought for in our series, no bony metastases were encountered. If the many bizarre manifestations of metastases are borne in mind, attention may be directed to a hitherto unrecognized bronchogenic carcinoma.

Pleural effusion occurs as the result of pleural metastases or with extension of secondary inflam-

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Fig. 19. Case 7 (190-4-30). Carcinoma of the left bronchus with resulting necrosis and infection extending to the cortex of the lung, causing a spontaneous pneumothorax with a subsequent pyopneumothorax. The pneumothorax cavity is clearly seen on the left.

Fig. 20. Case 7 (190-4-30). Photograph of the left lung, posterior view, showing the character of the nodules at the hilus, the multiple nodules in the lung parenchyma, the extensive fibrosis, bronchial thickenings and contraction of the lung. A, nodules near the hilus. B, multiple nodules in the parenchyma.

Fig. 21. Case 7 (190-4-30). Photomicrograph illustrating the character of the peribronchial invasion of the tumor mass.

Fig. 22. Case 8 (191-4-30). Late massive bronchus carcinoma of the left lower bronchus, showing large shadow of increased density with characteristic shadow of atelectasis peripheral to the main mass.

Fig. 23. Case 8 (191-4-30). Photograph showing the size, character and extent of the bronchogenic carcinoma in the left lung. Note the contraction in the direction of the hilus, the deviation of the trachea; A, and the effect upon the structures in the mediastinum. B, nodular growth at the hilus.

Fig. 24. Case 8 (191-4-30). Photomicrograph showing the relationship of the carcinoma cell masses to a large bronchus of the second order.

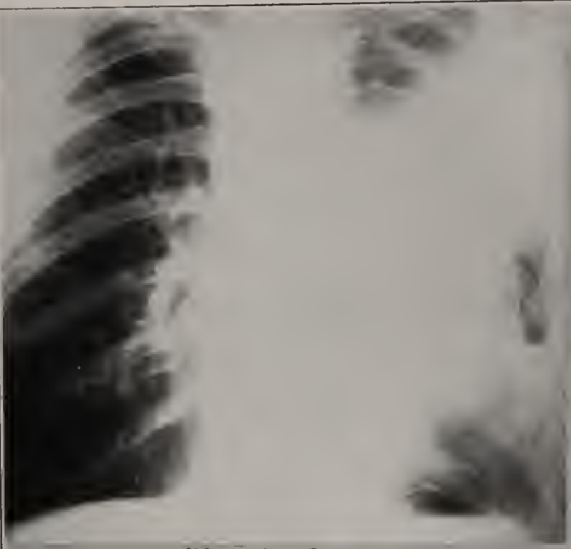

Fig. 19 Case 7

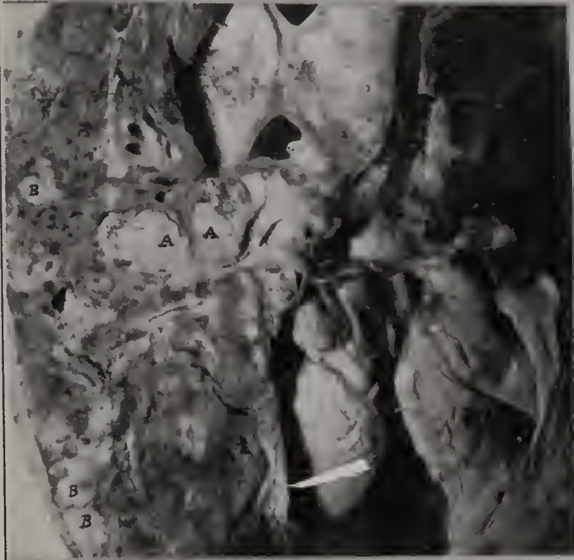

Fig. 20 Case 7

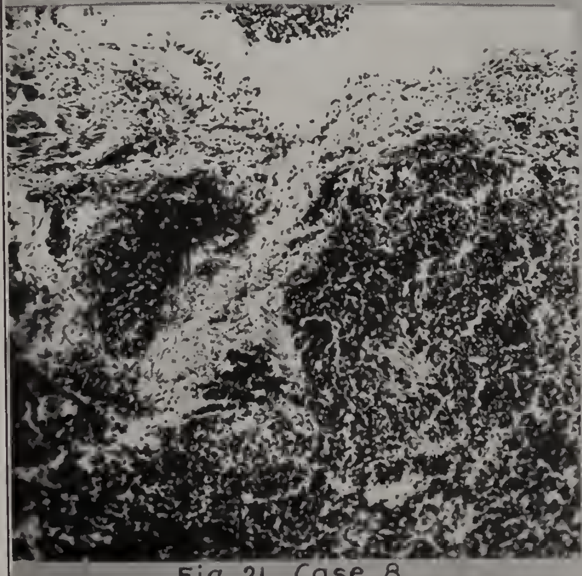

Fig. 21 Case 8

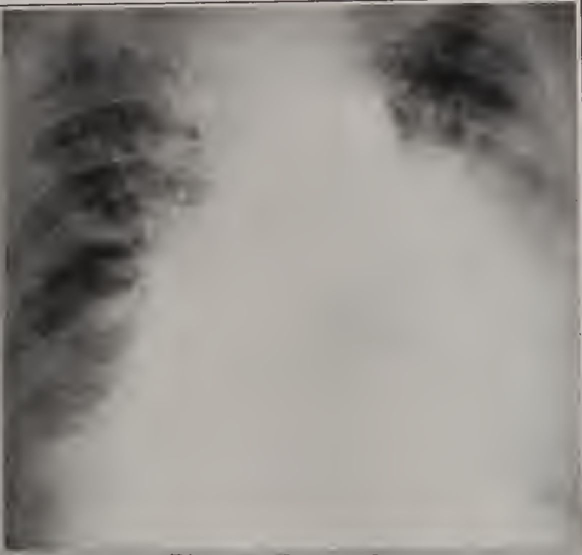

Fig. 22 Case 8

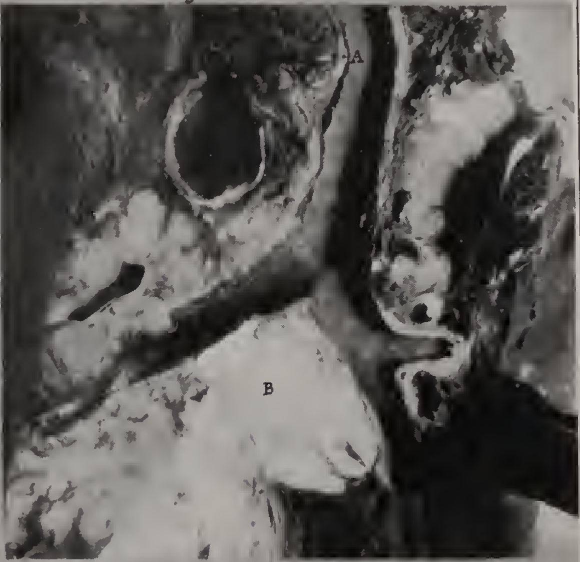

Fig. 23 Case 8

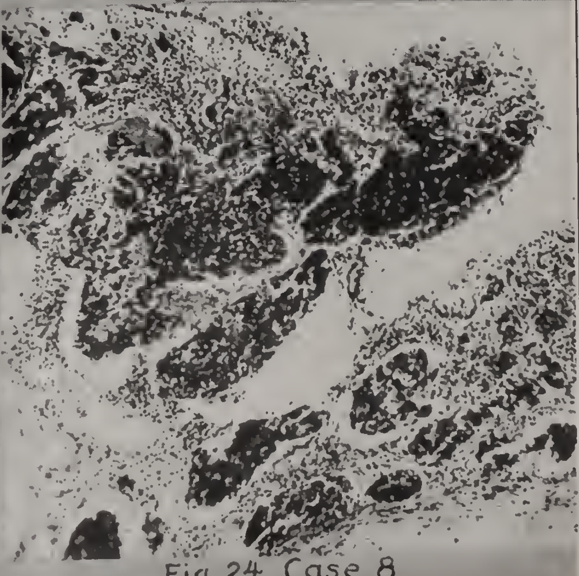

Fig. 24 Case 8

matory processes to the pleura. The fluid aspirated in the majority of cases is bloody or blood-tinged but not infrequently is clear and straw-colored, particularly in the early phases of pleural involvement. With pleural metastases the visceral pleura usually becomes firmly adherent to the parietal pleura with the formation of pockets of pleural fluid, so that a dry tap may be encountered with one paracentesis and fluid may be obtained with the next. The specific gravity of the pleural exudate is 1.018 or above, with an albumin content of 4 per cent or more which may coagulate soon after withdrawal. Microscopic examination of a centrifuge sediment occasionally shows the presence of carcinoma cells with mitotic figures. A small plug of tissue may be caught in the lumen of the needle and microscopic examination of this may reveal carcinoma. Occasionally metastases occur at the site of needle puncture, due to the deposits of carcinoma cells in the subcutaneous tissues. The authors have seen this occur on two occasions and a biopsy from this area disclosed carcinomatous tissue.

PHYSICAL EXAMINATION

While in bronchogenic carcinoma there is a lack of pathognomonic symptoms or physical signs, nevertheless, by a correlation of the history, symptoms and physical signs, a very typical syndrome is presented which should result in a correct diagnosis in the large majority of cases, even without bronchoscopy and biopsy. These two latter procedures obviously are the most accurate and dependable diagnostic methods, although caution should be exercised in placing too much reliance upon a negative biopsy, which may be the result of the specimen having been procured from contiguous inflammatory tissue, rather than from the real carcinomatous mass. This occurred in one instance (case 9), but notwithstanding the fact that the tissue removed during bronchoscopy was classified by the pathologist as of an inflammatory nature, adherence to the original diagnosis of bronchogenic carcinoma, made by a correlation of the history, physical and roentgenologic examination, proved it to be correct at autopsy.

Percussion and auscultation reveal very characteristic findings, especially in the hilar nodular type after stenosis has been produced. In our experience in this group, bronchostenosis has invariably been present and has occurred relatively early, after which the correlation of the percussion, auscultatory and roentgen-ray findings have been so typical that a correct diagnosis was made in all but two cases independently of the bronchoscope.

The first characteristic percussion finding in the hilar nodular group was that the impairment to percussion (dulness or flatness) was confined to the anterior part of the chest, over a rather large area of that anatomic unit conforming to the distribution of the involved bronchus (atelectasis). The second characteristic has been that, in addition, the percussion impairment has included the mediastinum, and has extended clear across this latter area to the opposite sternal margin, for the reason that metastasis to the regional mediastinal lymph nodes is always present and usually in a marked degree. A further finding on percussion has been the very sharp line of demarcation between impairment to percussion over the atelectatic area, and resonance or hyperresonance over the noninvolved area (compensatory emphysema). The extreme abruptness of these percussion changes is very typical of atelectasis, as a result of bronchostenosis and adjacent emphysema in the hilar nodular group of bronchogenic carcinoma, and has been a valuable aid in the differential diagnosis, from a standpoint of percussion (fig. 49, a, b, c). There are no such characteristic percussion changes in the diffuse necrotic group of bronchogenic carcinoma.

Auscultation also reveals definite findings in the hilar nodular group on the basis of the same phenomena that are responsible for the alteration in the percussion note, namely, bronchostenosis and atelectasis. A uniform auscultatory finding in this group is diminished or absent breath tones over the atelectatic area, which in our experience occurs very early. Furthermore, these diminished or absent breath tones are usually encountered anteriorly and, as in the case with percussion, there is a sharp line of demarcation between the area of diminished or absent breath tones (atelectasis), and the normal

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Fig. 25. Case 9 (20031). Massive carcinoma of the left upper lobe bronchus. The large shadow of density is produced by the carcinomatous mass with a very small area of atelectasis peripheral to it and marked emphysema in the uninvolved portions of lung. Old fibroid tuberculosis of the right apex. Note characteristic high-standing left hemidiaphragm.

Fig. 26. Case 9 (20031). Photograph showing the massive character of the tumor of the left upper lobe. Note the well definited border and the absence of fibrosis in the atelectatic lung substance about the tumor.

Fig. 27. Case 9 (20031). Photomicrograph illustrating the atypical squamous cell character and pattern of the cell invasion. Defensive polyblasts occur in large numbers in the stroma.

Fig. 28. Case 10 (382-9-30). Nodular type, bronchus carcinoma, left, with metastasis to right lung and Wassermann-fast blood. Note contour of carcinoma on left, resembling aneurysm.

Fig. 29. Case 10 (382-9-30). Photograph illustrating the massive nodule accumulation about the left main bronchus. Note the constriction of the aorta, the left main bronchus, trachea and right main bronchus. A, aorta. T, trachea.

Fig. 30. Case 10 (382-9-30). Photomicrograph illustrating scleromedullary type of carcinoma with dissemination into lymph channels and false tissue spaces about bronchi and blood vessels.

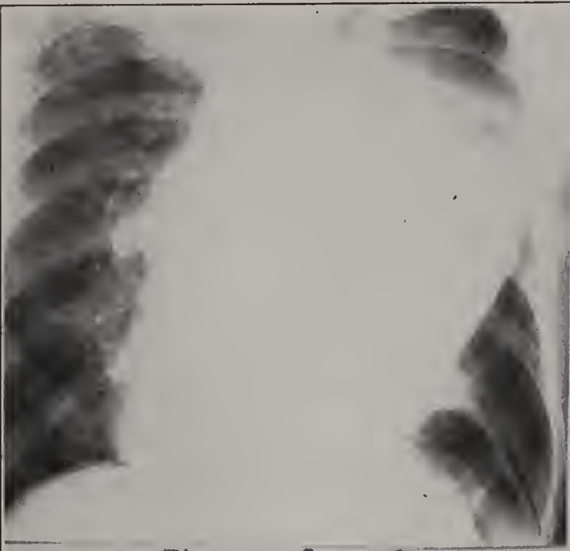
Fig 25 Case 9

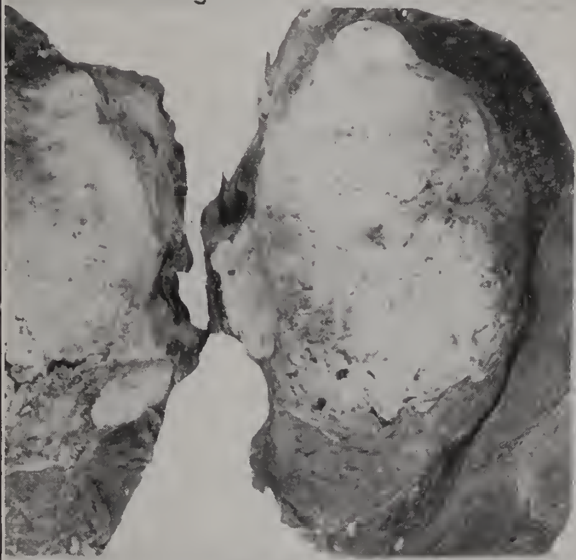
Fig 26 Case 9

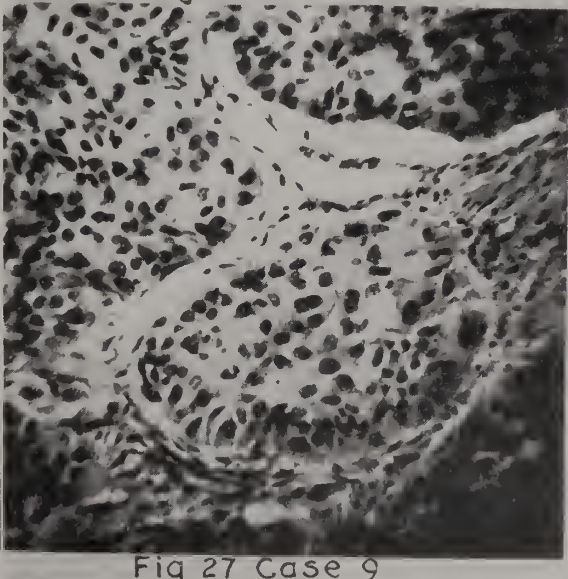
Fig 27 Case 9

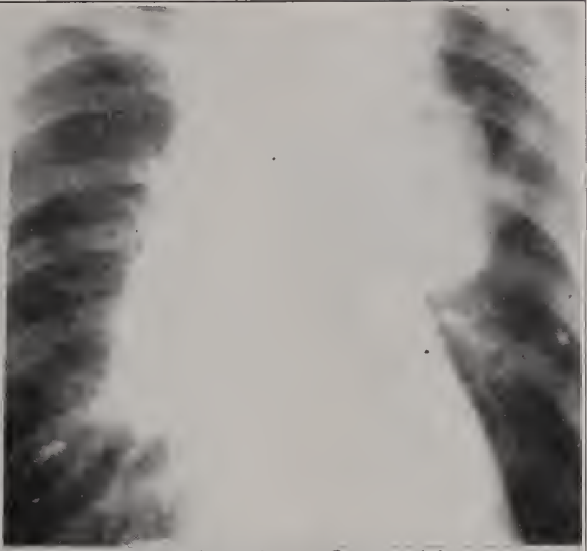
Fig. 28 Case 10

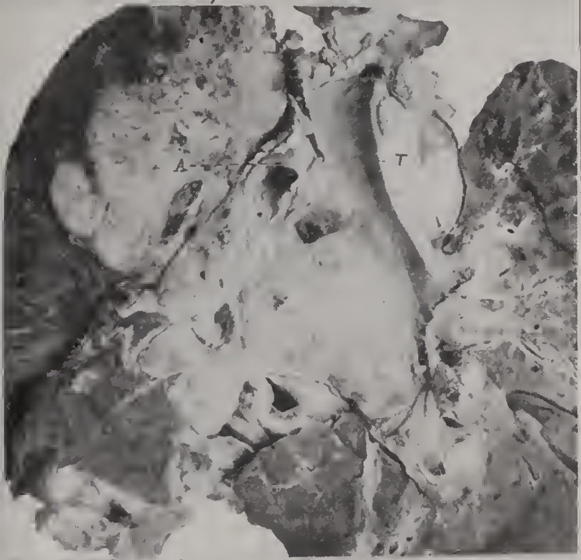

Fig. 29 Case 10

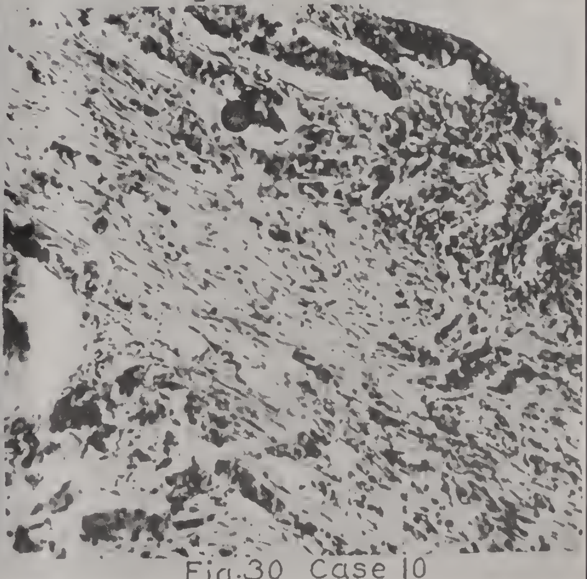
Fig. 30 Case 10

or sharpened vesicular breath tones over the adjacent area (compensatory emphysema).

Auscultation in the diffuse necrotic group furnished no characteristic findings in our series, with the exception that the breath tones were absent over different portions of the thorax involving wide areas (four cases), and in three cases bronchial breathing was heard over an area corresponding to the location of a cavity, following coagulation necrosis. The findings on physical examination in this group are often masked because of the presence of an associated pulmonary suppuration, abscess or empyema.

ROENTGEN-RAY EXAMINATION

Serial roentgen-ray films of bronchogenic carcinoma in the two groups and during various stages of the disease will present many different roentgen-ray lesions. The only uniform finding noted is a unilateral lesion which on subsequent films shows constant progression of disease.

Atelectasis, as a result of bronchostenosis which occurs with such regularity, often produces a typical roentgen-ray appearance, and in the author's experience has been one of the most dependable roentgen-ray findings in bronchogenic carcinoma. Most frequently this shadow is seen as an opaque area with an increased density about the hilus, which gradually fades out and becomes more translucent as it extends outward toward the periphery. where the margins become blurred, feathery and more transparent. The presence of the tumor mass proximally, with resulting atelectasis distal to it, produces physical characteristics which make for a marked decrease in transmission to light centrally, but on proceeding peripherally the transmission of light increases greatly until at the outer aspects

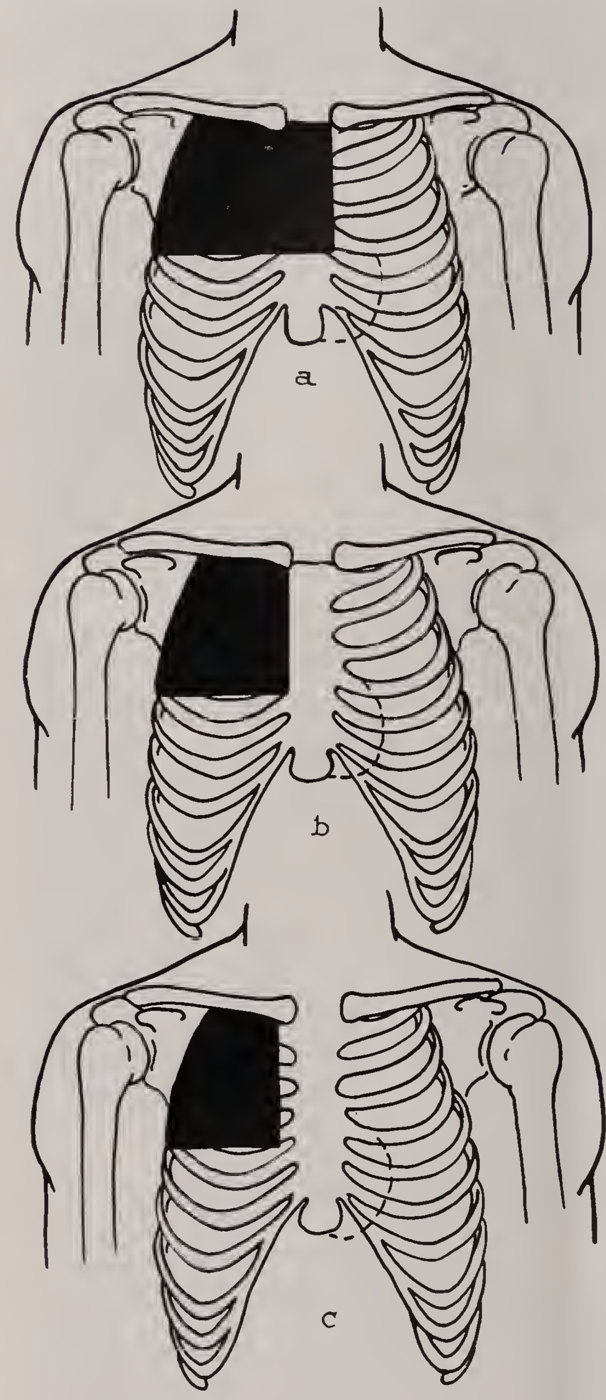

Fig. 49

a. Shaded portion represents characteristic area of percussion impairment in bronchogenic carcinoma, hilar type, right upper lobe bronchus (case 3). Note percussion flatness extends across mediastinum to opposite sternal margin.

b. Shaded portion represents percussion impairment in **acute** right upper lobe lesions, lung abscess, pneumonia, pulmonary tuberculosis. Note that impairment to percussion extends only to right sternal margin.

c. Shaded portion corresponding to impairment to percussion elicited in **chronic** right upper lobe lesions, pulmonary tuberculosis, chronic lung abscess, etc., with retraction of mediastinal contents and deviation of trachea to right. Note impairment to percussion does not extend to right sternal margin.

Fig. 31. Case 11 (20623). Photograph illustrating the diffuse character of the carcinomatous invasion. Note the small nodules which lie in the visceral pleura, N. Also, note the degree of fibrosis in the hilus and the extensive peribronchial fibrosis and contraction of the left lung. Necrosis and suppuration are pronounced.

Fig. 32. Case 11 (20623). Photomicrograph illustrating the papillary and adenomatous character of the carcinoma near the hilus. The myxomatous content, in addition to the cell type, points to the submucous glands as the origin of this tumor.

Fig. 33. Case 15 (24064). Photograph illustrating A, the associated saccular aneurism, and B, multiple metastatic nodules in the liver. This illustration should be studied in connection with figures 43, 44 and 45, case 15.

Fig. 34. Case 12 (9110). Carcinoma of the left main bronchus, showing characteristic shadow of increased density in the left lower lung with decreasing opacity extending towards the superficies of the lung.

Fig. 35. Case 12 (9110). Photograph showing the diffuse character and distribution of the carcinoma which extends out from the hilus of the left lung. Note the extensive fibrosis and contraction in the direction of the hilus. The process is apparently one of long standing, resulting in fibrotic replacement of the parenchyma. Multiple foci of coagulation necrosis and suppuration are seen.

Fig. 36. Case 12 (9110). Photomicrograph illustrating the adenomatous character of the new growth in greatly modified capillary channels.

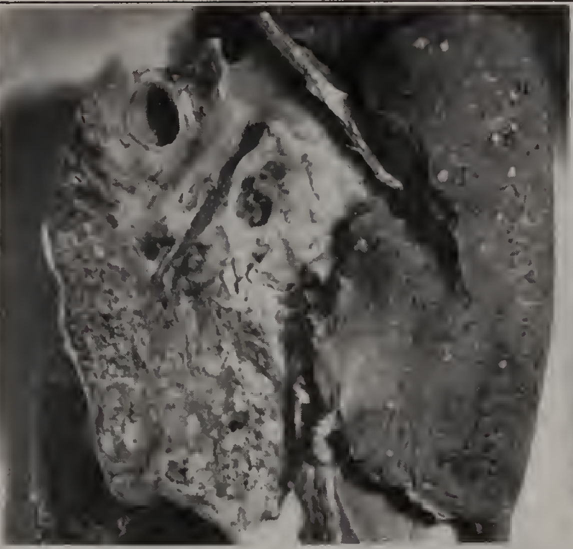

Fig. 31 Case 11

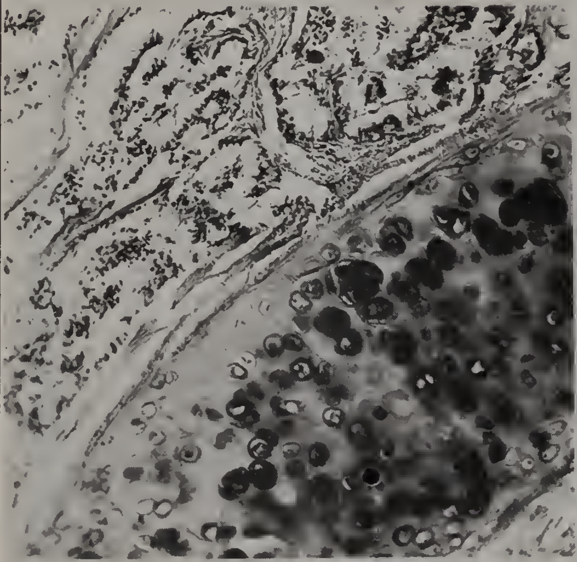

Fig. 32 Case 11

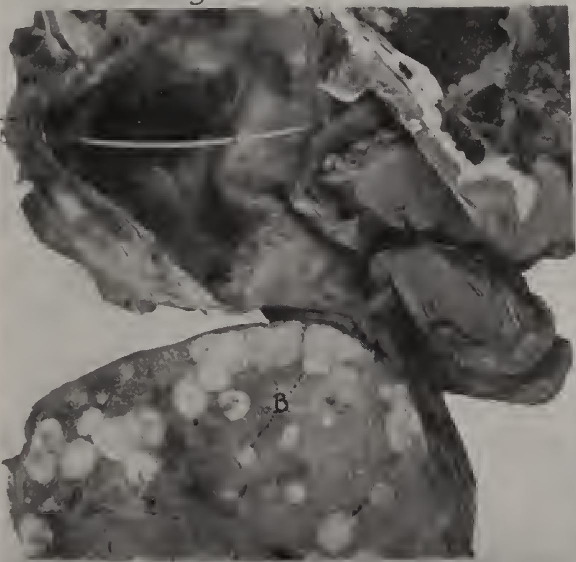

Fig 33 Case 15

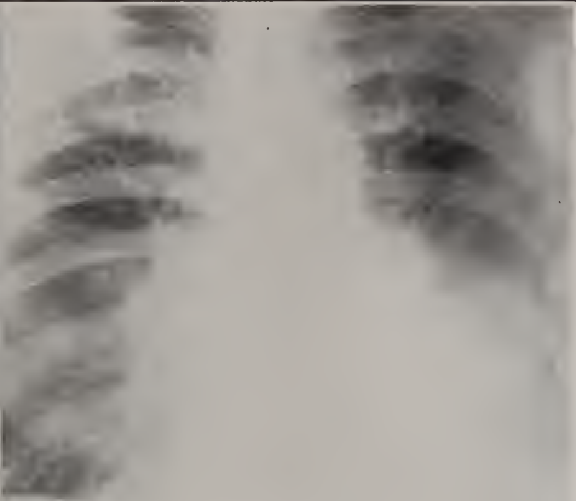

Fig. 34 Case 12

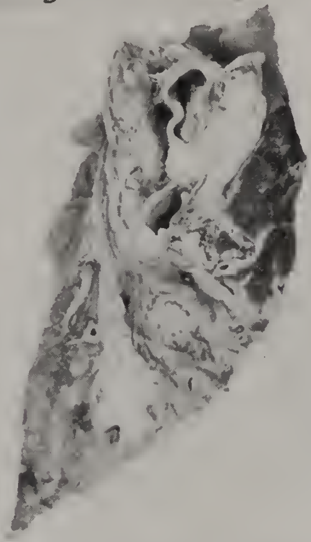

Fig. 35 Case 12

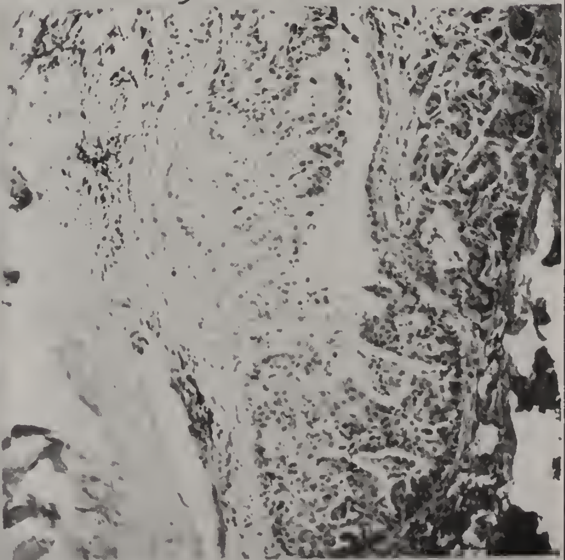

Fig. 36. Case 12

lung tissue can be visualized. This type of shadow proceeding outwards from the hilus into the midportion of the lung, leaving the adjacent apex or base uninvolved, with the exception that there is a marked apical or basilar emphysema, is extremely suggestive of bronchogenic carcinoma (case 9).

The hilar nodular group may occasionally produce a shadow of increasing density, lobar in character, occupying usually the upper one-third or one-half of the affected hemithorax, with a rather straight, horizontal line of demarcation between it and the adjacent area of compensatory emphysema, which may simulate from a roentgen-ray standpoint alone chronic lung cirrhosis, caseous pneumonia, or a chronic indurative process as a result of fibrosis (case 3). In this instance previous knowledge on the part of the roentgenologist concerning the history and physical signs will be necessary in arriving at a correct conclusion.

The roentgen-ray appearance of the diffuse necrotic type is frequently seen at first as an irregular triangular shadow in the midportion of the lung, extending outwards with its base in the region of the hilus, while the apex projecting into the lung substance is made up of a series of linear strand-like processes. These rather typical, radially disposed roentgen-ray markings at the lateral margins of this configuration are produced by the many small metastatic nodules appearing along the course of peribronchial lymphatics, which are particularly prone to occur in the diffuse necrotic group, wherein this type of metastasis is so common (case 16). Along with this, at the outer aspect of these shadows, areas of atelectasis will be observed in various portions of the lung substance. Later, after necrosis and infection take place, abscess formation, pleural effusion and empyema supervene, whereupon the roentgen-ray appearance becomes much more confusing and the lesions more obscure. Not infrequently, however, even after these complications are established, characteristic shadows of atelectasis remain, which fact furnishes strong corroborative evidence of the nature of the underlying lesion. Pleural fibrosis, effusion or empyema, by producing a dense uniform shadow throughout, may completely obscure a necrotic lung abscess as well as the tumor itself, the presence of which will only be revealed at the autopsy table, if dependence is placed upon the roentgen-ray film alone.

Metastatic lung carcinoma does not resemble bronchogenic carcinoma in either physical signs or roentgen-ray appearance for the reasons that the lesions are usually bilateral, seldom produce bronchostenosis or necrosis, and pulmonary symptoms and physical signs are frequently very benign, at times almost absent, even in the presence of a wealth of pathologic changes. Careful search for the primary source of extrapulmonary malignancy will usually disclose the original site of disease. Bronchiectasis, from a standpoint of differential diagnosis so frequently mentioned in the clinical pathologic roentgen-ray discussions of bronchogenic carcinoma, produces no clinical symptoms, physical signs, roentgen-ray findings or pathologic evidence of its presence and in consequence does not enter into consideration.

Fluoroscopic investigation of the mediastinal space in the oblique positions will furnish valuable information in ruling out mediastinal tumors, primary pulmonary Hodgkini, interlobar empyema, aortic aneurysm, benign pulmonary tumors, metastatic pulmonary carcinoma and opaque foreign bodies, all of which have certain features by which they can usually be identified. Narrowing of intercostal spaces, with an increased obliquity of the ribs and a retraction of the mediastinal contents to the affected side, is also frequently noted. Careful study of the affected side will often elicit a high standing diaphragm with some limitation of motion, or even paradox diaphragm movement on the involved side especially, if bronchostenosis is complete and involves a large main bronchus.

DIFFERENTIAL DIAGNOSIS

The hilar nodular group of bronchogenic carcinoma, during the early phase, may simulate some forms of infiltrations due to pulmonary tuberculosis, as perihilar and apical tuberculous infiltration rarely seen in the carcinoma age group. The ordinary fibrocaseous pulmonary tuberculosis, with its characteristic radiologic markings ("mottling,"

Fig. 37. Case 13 (36-1-30). Diffuse carcinoma of the right lung, arising from the right main bronchus with characteristic shadow of obstructive atelectasis.

Fig. 38. Case 13 (36-1-30). Photograph illustrating the diffuse character of the growth with the fibrosis extending out from the hilus of the right lung, the occurrence of small nodules throughout the parenchyma, P, the pneumonic consolidation and areas of liquifaction necrosis with suppuration.

Fig. 39. Case 13 (36-1-30). Photomicrograph illustrating the extensive invasion and character of the cells which were found filling the atria and tissue spaces. The anaplasia of the cells is marked.

Fig. 40. Case 14 (24984). Diffuse type right bronchus carcinoma, with metastasis producing mild atelectasis in the right lung. A tuberculous cavity is also present.

Fig. 41. Case 14 (24984). Photograph illustrating the diffuse character and extensive involvement of the right lower lobe. Note A, the extensive peribronchial thickening; B, the central abscess cavity; the marked thickening of the pleura and the compression of the upper lobe.

Fig. 42. Case 14 (24984). Photomicrograph illustrating the squamous cell character of the carcinoma in this area with a delicate stroma and a rich wandering cell infiltration.

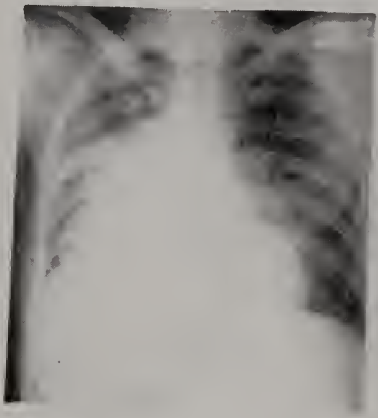

Fig. 37 Case 13

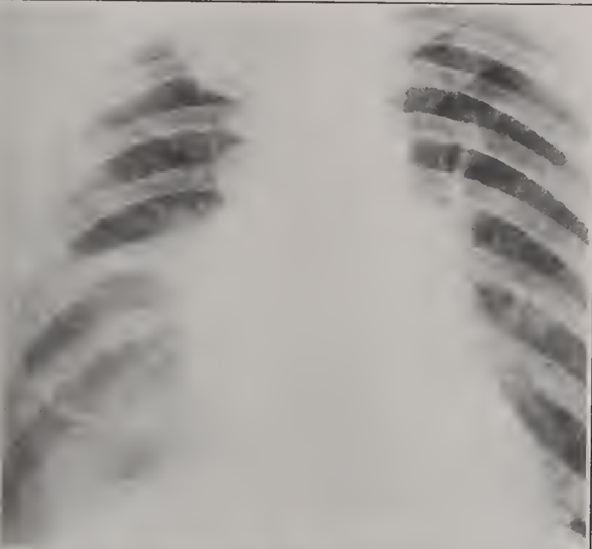

Fig. 40 Case 14

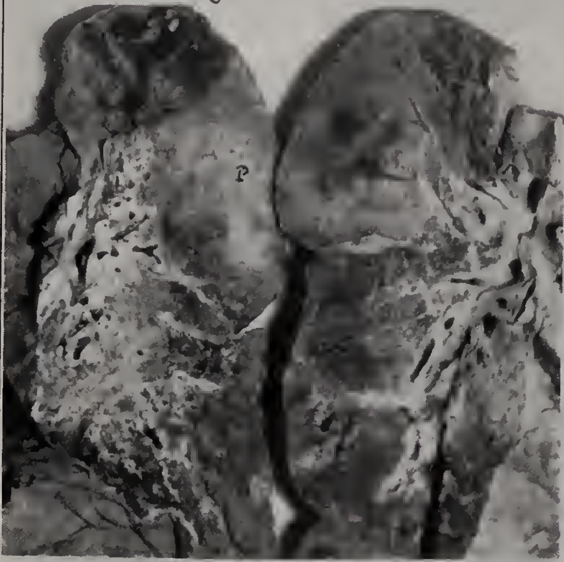

Fig. 38 Case 13

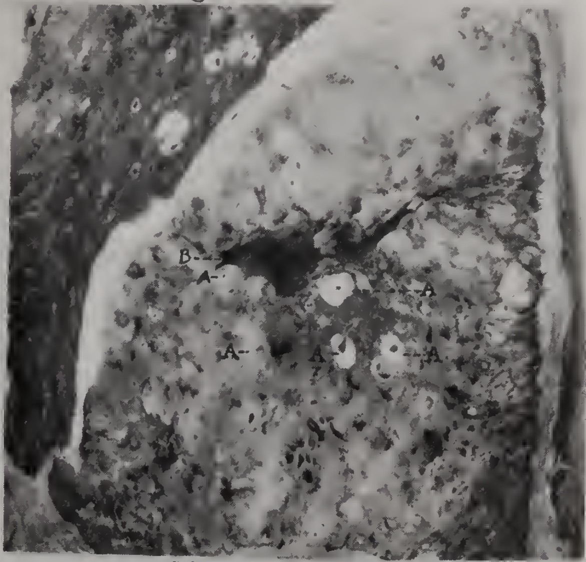

Fig. 41 Case 14

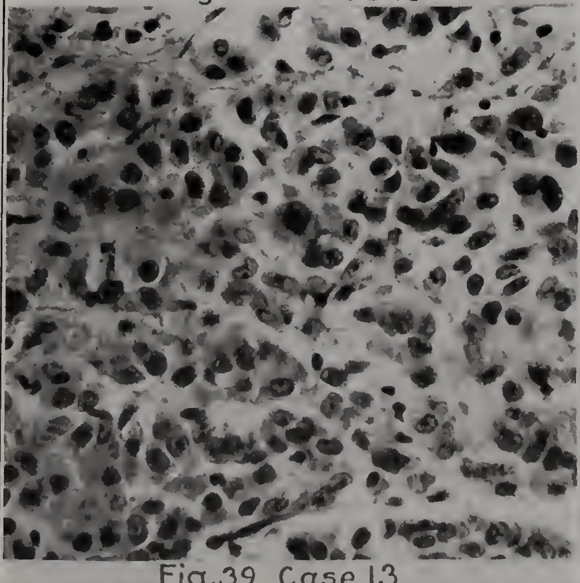

Fig. 39 Case 13

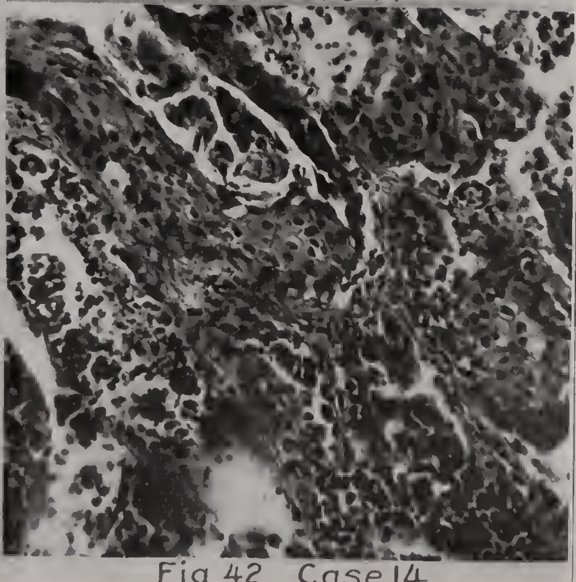

Fig 42 Case 14

etc.) should offer no difficulty. However, if bronchostenosis is present, which occurs sooner or later, there will be no confusion, as pulmonary tuberculosis seldom if ever presents the characteristic percussion and ausculatory findings mentioned above, that are present in bronchogenic carcinoma. Carcinoma is always progressive, while tuberculosis is frequently retrogressive. The type of pain frequently associated with the hilar nodular group of bronchogenic carcinoma is seldom present in pulmonary tuberculosis. Pain if present, in the latter disease, is never so severe nor of the same deep-seated, dull, "boring" character experienced in bronchogenic carcinoma. Pulmonary tuberculosis is more frequently associated with brisk bleeding than is bronchogenic carcinoma, while the bleeding in the latter is more often manifested as blood-tinged sputum. Bronchoscopy will remove any final doubt.

LUNG ABSCESS

The diffuse or disseminated group of bronchogenic carcinoma will be confused more frequently with the gangrenous form of lung abscess caused by the vibrio, spirochetes, etc., rather than with the ordinary pyogenic forms of lung abscess. However, almost without exception, a definite etiologic factor can always be associated with the causation of ordinary lung abscess. Furthermore, the development of cavity formation in the pyogenic form of lung abscess occurs early in the course of the disease, whereas in bronchogenic carcinoma the abscess cavity appears late. The clear-cut circular margins of the circumference of ordinary lung abscess are more frequently visible and the abscess is larger in extent than in bronchogenic carcinoma, wherein the cavity is more ill defined, without clear-cut borders and of irregular shape, and more frequently not visible on account of the presence of associated atelectasis, diffuse pulmonary suppuration, pleural thickening, indurative pneumonia or carcinomatous masses (case 5).

When necrosis appears, which is always the case in the diffuse necrotic type, the expectoration takes on the characteristics of the ordinary gangrenous type of lung abscess, differing from the latter, however, in that it is usually not so abundant on account of bronchostenosis and poorer drainage, devoid of the foul, penetrating odor, and does not separate into the characteristic three layers of serum, mucus and pus. The careful bacteriologic examination of the sputum of the ordinary gangrenous type of abscess will reveal the characteristic organisms (vibrio, spirochetes, streptothrix, etc.) in abundant preponderance which are lacking in bronchogenic carcinoma, while the investigation of the sputum of the pyogenic lung abscess will reveal the predominance of pus-producing organisms to the exclusion of other bacterial forms. While chills, fever, sweating and other evidences of sepsis will be present in both the pyogenic lung abscess and the necrotic abscess of bronchogenic carcinoma, no typical differential features are noted. Again, it must be emphasized that bronchoscopy will be the deciding factor.

PLEURAL EFFUSION AND EMPYEMA

A most significant fact in relation to pleural effusion in bronchogenic carcinoma is the tendency for rapid reaccumulation of the exudate after repeated aspirations over a prolonged period. An effusion of this sort in an individual in the carcinoma age is strongly suggestive of bronchogenic carcinoma, whether the exudate is serous, serosanguineous or purulent, particularly when it is associated with an obscure cause, atypical physical signs and radiologic findings. It must be borne in mind that other diseases of the lung and pleura are associated with bloody pleural effusions, while the effusion as a result of bronchogenic carcinoma is frequently not sanguineous. Another characteristic phenomenon of pleural exudate, in bronchogenic carcinoma, is that the relief of dyspnea following aspiration is not so great as one would anticipate after removal of rather large quantities of fluid, such as occurs in primary pleuritis exudativa, obviously for the reason that the primary underlying factors in the production of dyspnea (bronchostenosis, etc.) remain unaltered. Furthermore, the usual displacement of the heart and mediastinal contents, as seen in the ordinary pleural exudate, is not present in the same degree in bronchogenic carcinoma, as this

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Fig. 43. Case 15 (24064). Massive diffuse infiltrative bronchus carcinoma of the left lung, producing characteristic shadow of decreased density at the periphery of the upper lung area.

Fig. 44. Case 15 (24064). Photogroph illustrating the diffuse character of the growth with extensive peribronchial fibrosis, contraction, atelectasis and suppurative necrosis.

Fig. 45. Case 15 (24064). Photomicrograph illustrating the diffuse medullary scirrhous character of the growth, the large polyhedral outline of the cells and the occurrence of an epithelial mass within a blood vessel.

Fig. 46. Case 16 (357-8-30). Massive diffuse infiltrative bronchus carcinoma, producing shadow of increased density towards the hilus, while the surrounding atelectasis produces the characteristic shadow of decreasing density towards the periphery of lung.

Fig. 47. Case 16 (357-8-30). Photograph illustrating the diffuse character of the growth, the extensive suppuration, necrosis and fragmentation of the lung parenchyma.

Fig. 48. Case 16 (357-8-30). Photomicrograph illustrating the papillary character of the carcinomatous invasion, the sparse stroma and the loose texture.

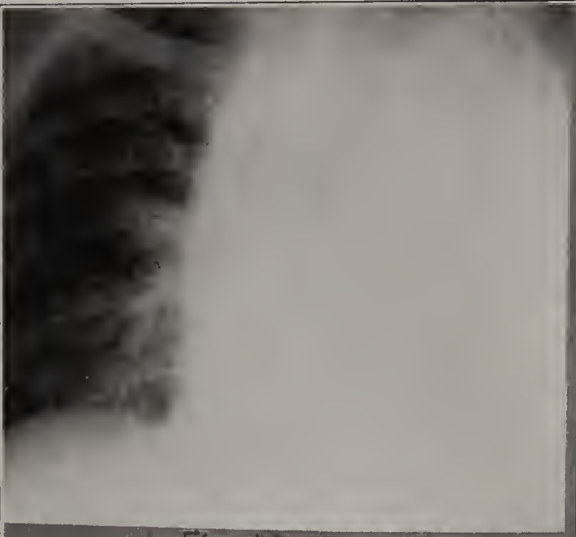
Fig. 43 Case 15

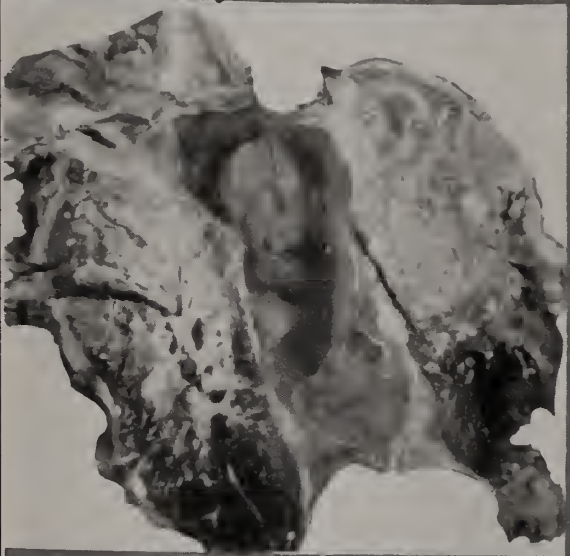
Fig. 44 Case 15

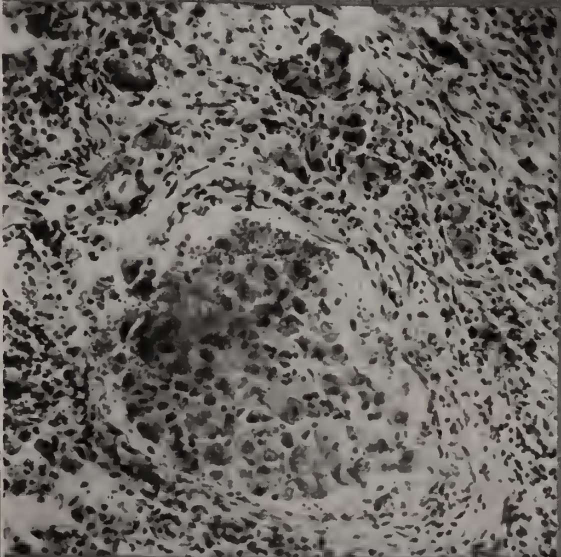
Fig. 45 Case 15

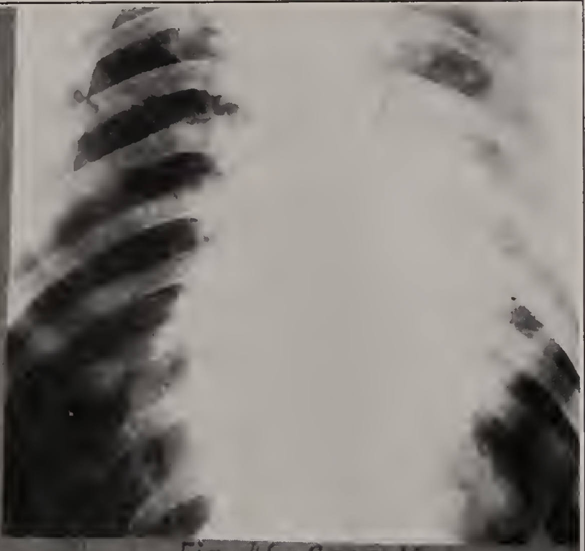
Fig. 46 Case 16

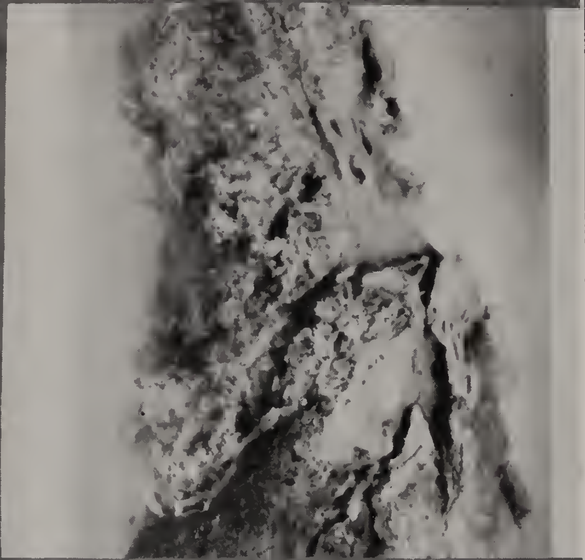
Fig. 47 Case 16

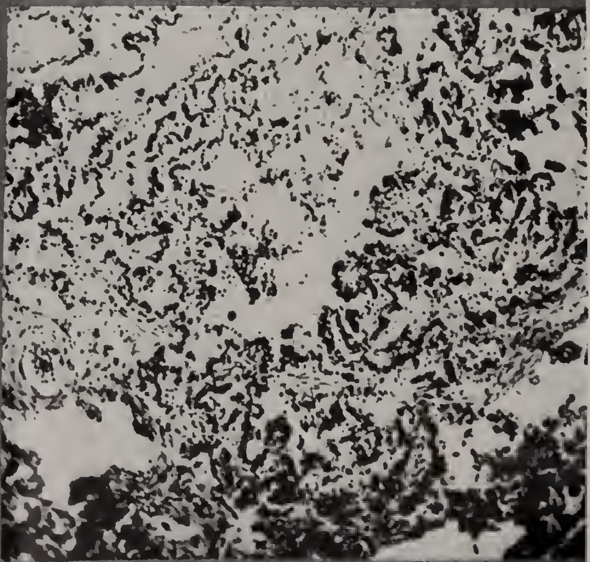
Fig. 48 Case 16

displacement is prevented by the fixation of the lung and pleura, due to carcinomatous invasion.

The diffuse necrotic form of bronchogenic carcinoma will frequently result in the production of empyema (case 7), whereupon difficulites will be presented in differentiating this from the ordinary forms of empyema, but in general it may be said that the empyema formations following bronchogenic carcinoma are more apt to be smaller in amount, more sacculated in pocket-like collections, and in consequence more difficult to locate than the ordinary forms of empyema. The clear-cut borders of the triangular shaped shadow of interlobar empyema will readily identify this process from bronchogenic carcinoma. Empyemas of pyogenic origin are frequently associated with a known etiologic cause, which can often be elicited from a careful history.

ANEURYSM

Aneurysm of the aortic arch is suspected most frequently in the hilar nodular type of bronchogenic carcinoma, and more particularly when too much dependence is placed upon the silhouette of a flat roentgen-ray film (case 10). Aneurysm produces bronchostenosis very late, and only after assuming immense proportions, while the hilar nodular type of bronchogenic carcinoma produces this phenomenon very early, with a tumor mass of relatively small dimensions. The outline of the aneurysmal sac is usually seen as a round shadow of increased density, continuous with the aorta, occasionally pulsating, presenting sharp, clear-cut margins which should not be confused with bronchogenic carcinoma, wherein the shadow is usually not so clear-cut and is never associated with the aorta. A careful fluoroscopic examination in the oblique positions in aortic aneurysm will reveal the outline of the widened aorta, encroaching upon the retrocardiac space, while in bronchogenic carcinoma the retrocardiac space will appear more normal and clearly visible in the region of the aorta.

A luetic history, corroborated by a positive Wassermann, coupled with atypical shadows in the region of the aorta, does not always substantiate the diagnosis of aortic aneurysm, as the authors have encountered three such cases, wherein there was a positive Wassermann with latent lues, but a diagnosis of bronchogenic carcinoma was made in each instance, which was confirmed at autopsy (case 10). It is almost unnecessary to state that bronchoscopy should not be instituted in the presence of an aneurysm.

We have seen from the pathologic observations that the blood supply of the newgrowth is frequently diminished either through compression by the carcinomatous masses upon the bronchial and pulmonary arteries, and the occlusion of these arteries by carcinomatous cells or thrombi, or by the simple fact that the newgrowth extends beyond its blood supply, all of which result in coagulation necrosis, whereupon is provided an excellent culture medium for bacterial invasion. This is particularly true in the diffuse necrotic group, wherein we feel, as a result of our studies, necrosis occurs consistently, that infection is the rule, and suppuration follows without fail. Thus, it is apparent that this train of pathologic events in bronchogenic carcinoma can be followed by the production of a syndrome simulating septic infection of the lung with fever, leucocytosis, malaise, chills, such as is encountered in pneumonia, bronchopneumonia, lung abscess, empyema or so-called "flu." As a consequence of these facts, bronchogenic carcinoma should be borne in mind whenever one is confronted with an individual in later adult life, presenting any confusing respiratory syndrome with obscure chest symptoms, associated with an atypical history, physical signs or roentgenologic findings.

SUMMARY

1. A study of sixteen instances of primary bronchogenic carcinoma with a correlation of the pathologic and clinical findings is presented.

2. Primary bronchogenic carcinomas are divisible into two distinctive groups, the hilar nodular and the diffuse necrotic. Further pathologic classification is superfluous and unnecessary.

3. It is pointed out that the cell type does not offer an exact means of differentiating the various forms of primary bronchogenic carcinoma.

4. The initial site of primary bronchogenic carcinoma may be found in any part of the bronchial lining or the submucous glands, but is most frequent in the primary and secondary bronchi.

5. Primary bronchogenic carcinoma probably never arises from the atrial lining cells.

6. The symptomatology, physical signs and roentgenologic findings can all be explained on the basis of the pathologic changes.

7. In our opinion there is a definite increase in the incidence of primary bronchogenic carcinoma.

SURGICAL TREATMENT OF GASTRIC LESIONS*

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Most considerations of surgical lesions of the stomach deal with the author's personal opinions on the relative merits of conservative or radical operations for gastric and duodenal ulcers. In the discussion which usually follows, particularly if the audience consists of both clinicians and surgeons, some one usually calls attention to the fact that because of the unknown etiology of gastric and duodenal ulcers, methods of surgical treatment directed toward their eradication will never be quite satisfactory. The argument will be supported by calling attention to the fact that recurring ulcer may follow operative procedures, and the symposium may be concluded, leaving a feeling of uncertainty in the minds of some, who are not well versed in the results of all types of treatment of gastric lesions, as to really what should be done for these patients.

At the beginning of this paper, therefore, it might be well to make a few statements concerning factors regarding gastric and duodenal ulcers that would appear to be frequently overlooked. It would seem necessary in speaking of peptic ulcer to distinguish between gastric and duodenal ulcerating lesions, especially since their pathologic difference should influence one's decision regarding their treatment. The principal fact in this connection is that ulcerating lesions of the stomach may be ulcerating carcinomas or carcinomatous ulcers, and I know of no scientific way of differentiating without microscopic examinations of the removed lesion. The smallest gastric lesion may still be carcinomatous. I have, on a few occasions, removed carcinomatous lesions of the stomach no larger than 1 cm. in diameter. Whether these started as carcinomas with areas of ulceration or whether they started as ulcers and became carcinomas seems to me to be only of academic interest. The fact remains that the lesions were carcinomatous. The full burden of responsibility seems to lie directly on the physician advising medical treatment for gastric lesions.

It has been said that, unless the symptoms of hemorrhage, perforation or obstruction exist, which nearly every one agrees are indications for surgical procedures, the patients should be given a trial at medical treatment. To substantiate this, I should like to call attention to the fact that last year 55 per cent of the patients seen at the clinic with duodenal ulcer were placed on medical treatment, usually ambulatory, and the remaining 45 per cent were considered cases for surgical treatment. It should be noted that these percentages apply to cases of duodenal ulcer.

Carefully controlled experiments on the part played by focal infection is illustrative of one of the etiologic factors concerned in the formation of duodenal ulcer. In this connection it might be well to recall that similar circumstances exist in cases of cholecystitis, of renal calculi or of fibroadenomatous hypertrophy of the prostate gland. Compare the etiologic factors concerned in these conditions with those of gastric and duodenal ulcer. Does the balance weigh any more favorably in either direction or, in point of fact, do the results of treatment or the incidence of recurrence vary appreciably? I am sure the general opinion is that the scale is in almost perfect balance and yet the results are no more brilliant than in the treatment of such lesions, if operative procedures are indicated for removal of the lesion and the relief of obstruction.

I am directing attention to these facts because I think that we need not apologize for the results obtained in the surgical treatment of gastric and duodenal ulcer, if indications for operative procedures have been present and if proper operative procedures have been carried out. However, it is not my purpose at this time to consider the relative merits of gastroenterostomy, pyloroplasty or resection of the stomach except to say that, if the conservative surgical treatment of duodenal ulcer can be undertaken at a risk of less than 1 per cent, and the conservative surgical treatment of gastric ulcer can be undertaken with a risk of less than 1.5 per cent, 90 per cent or more of the patients will be relieved of their symptoms.

In the few cases in which a gastrojejunal ulcer develops it will often be found that the original duodenal ulcer, for which the gastroenterostomy had been performed, has healed and after the removal of the gastrojejunal ulcer, normal continuity between stomach and duodenum or intestine can be restored with the expectation that as satisfactory results will occur without any greater incidence of recurrence as after the nonoperative cure of duodenal ulcer. The only difference is, of course, that in the surgical case, when such procedure is carried out, the surgeon knows whether or not the duodenal ulcer is healed. In other cases of gastrojejunal ulceration, after the removal of the gastrojejunal ulcer and the closure of the openings in the jejunum and stomach, pyloroplasty with removal of the original ulcer may be advisable. In some cases of extensive gastrojejunal ulceration, or in cases in which the original ulcer does not appear to have properly healed, or in healing has narrowed the first portion of the duodenum so that satisfactory pyloroplasty cannot be carried out, gastric resection is indicated. Such a plan of procedure carried through in the treatment of gastrojejunal ulceration at the clinic last year (1930) carried a mortality of 3.5 per cent.

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*Read before a meeting of Seattle Surgical Society, Seattle, Wash., February 6-7, 1931.

The problem that confronts all of us is that of the patient with a bleeding duodenal ulcer. Such ulcers may be multiple, but if the ulcer is single, it is usually situated on the posterior wall of the duodenum and perforation has taken place into the pancreas. A small blood vessel in the crater of such a perforating ulcer usually will be found to be the cause of the hemorrhage. It has been my custom in such cases, whenever possible, to remove or destroy the lesions either by cautery or resection of the ulcer. If resection is advisable, pylorectomy, combined with resection of as much of the lower end of the stomach as is thought desirable, reconstructing the anastomosis as a Billroth I, has served admirably. When the ulcers were small and situated only on the anterior wall, excision combined with one of the plastic procedures has worked out very satisfactorily. Unfortunately, in many cases of bleeding duodenal ulcer the large size of the lesion, the subacute inflammation and the immobility of the first and second portions of the duodenum make excision or resection of this portion of the duodenum an exceedingly hazardous undertaking. In these cases the patient is much better off and certainly the surgeon is assuming much less risk to be content with gastroenterostomy, which will prevent recurrence of the bleeding in 80 per cent of these cases, than to attempt a direct attack on the lesion. Should bleeding recur after gastroenterostomy, a secondary operation can always be undertaken, at which time it is usually possible to remove the bleeding, ulcerating areas much more easily and much more safely to the patient, because of relief of the inflammatory edema by proper drainage of the stomach brought about by the previous gastroenterostomy.

POSTOPERATIVE COMPLICATIONS

Complications following properly performed gastroenterostomy are rare. The so-called vicious circle of vomiting is due to true mechanical obstruction with one exception, the result of faulty technic. It is either the result of inflammation in the anastomosis or strangulation of one or the other loops of the jejunum in the anastomosis by the transverse mesocolon, or it is due to the angulation and fixation of the distal portion of the jejunum in the anastomosis from infection. The first of these causes is usually characterized by the development of increasingly progressive gastric retention accompanied by fever, while the true mechanical obstruction from the transverse mesocolon is usually evident from the beginning with a large amount of fluid vomited but better aspirated from the stomach daily. In either type of obstruction, the patient may be safely carried along for a few days by the intravenous injection of physiologic solution of sodium chloride with or without 10 per cent glucose. In addition, the stomach should be kept empty by the passage of a stomach tube as often as necessary. If the obstruction continues beyond the seventh or eighth day, exploration of the anastomosis should be carried out.

If the obstruction is inflammatory, a tube may be passed through a small opening made in the stomach down into the distal loop of the jejunum for feeding. At the same time this tube allows the passage of fluid and secretion from the stomach alongside of it into the jejunum. If the stomach is inaccessible, two catheters can be introduced, one directed upward through the anastomosis into the stomach and the other downward into the jejunum for feeding. When feeding is not being carried out, the catheters can be attached together so that the fluid leaving the stomach in the upper tube will pass down into the jejunum through the lower one. If the obstruction is truly mechanical from the traction into the lesser peritoneal cavity of the anastomosis, thus strangling the loops of the jejunum, the reattachment of the mesocolon to the stomach above the anastomosis will suffice. Whenever there is doubt as to the efficacy of the procedure being carried out to relieve the obstruction, it may be safer to remove the gastroenterostomy and after closing the openings allow gastrointestinal continuity to return to the preoperative condition.

It is fairly well understood that one of the indices of the patient's condition, if upper intestinal obstruction exists, is the level of the blood chlorides and of the blood urea and the height of the blood pressure. If too much fluid is lost from the body as the result of such obstruction, the blood chlorides are below normal, the urea is above normal, and the blood pressure is decreased. Even with these satisfactory indices of the patient's condition, there is no doubt that, although the chemical constituents of the blood are kept within normal limits by the administration of sufficient fluids, a prolonged period of obstruction will reduce the vitality of the patient, and hence secondary operative procedures directed to the relief of the obstruction should not be too long delayed.

CARCINOMA OF THE STOMACH

There is no need, I believe, to review the various types of restoration of gastrointestinal continuity after resection of the stomach. It might be interesting, however, to know that the posterior Polya, and anterior Polya-Balfour[1] and the Billroth I procedures are most commonly used at the clinic.

The Polya type of operation is widely used in this country, but the Billroth I operation has not been so extensively employed. There has been hesitancy in carrying out the Billroth I operation because it was originally discarded by Billroth, due principally to what he thought was a dangerous suture angle formed at the point of the meeting of the three lines of suture in the anastomosis, as well as the fact that little has been written of the indications for the operation or the results following its use in different types of cases. During the last six years I have used this method of gastric resection in more than fifty cases, both for carcinoma of the stomach and for bleeding gastric or duodenal ulcers.

The Billroth I operation consists of resection of the portion of the duodenum containing the lesion, if an ulcer exists, or of that portion of the stomach containing carcinoma, with direct anastomosis between the upper end of the stomach and the duodenum; the stomach is narrowed by suture to the extent that the opening in it is similar to that of the duodenum. The essentials and safety of the operation are dependent on there being sufficient normal stomach above the gastric lesion to be resected so that the anastomosis can be made to the duodenum without tension, and exposure of the first and second portions of the duodenum can be made with sufficient ease to make such anastomosis accurate. In cases in which the caliber of the duodenum has appeared to be small, I have not hesitated to extend the excision down its anterior wall, thus giving as large a size to the anastomotic opening as is desired. Illustrative of results of the operation in cases of carcinoma are four cases of carcinoma, graded 1 or 2, without lymphatic in-

which the patient was living and well for at least two years following total gastrectomy.

volvement, in which the growths were removed successfully and gastroduodenal continuity restored by the Billroth I procedure.

The oldest patient was in her seventy-eighth year and was operated on in March of last year; she has been perfectly well since the operation. This patient had gastric retention varying from 1,200 to 1,500 cc., due to the site of the lesion at the pylorus; it was necessary because of the size of the carcinoma to remove three-fourths of the stomach. This case illustrates the fact that indications for the operation depend not particularly on the amount of stomach removed, but on the necessity of the anastomosis between the end of the stomach and duodenum being made without tension. Whenever preoperative obstruction has occurred in such cases, particularly in elderly patients, I have felt it advisable in addition to perform temporary jejunostomy for feeding which gives complete control of the patient's nutrition. The other three patients, all aged more than seventy years, have recently left the hospital.

TOTAL GASTRECTOMY

Attention should be called to the fact that total gastrectomy could probably be done in more cases. Such a possibility supports the surgeon in his decision to advise exploration in cases of carcinoma of the stomach regardless of site by roentgen-ray examination, provided the condition of the patient permits.

Total gastrectomy has been performed nine times at the clinic; four operations were done during the last three years and three of these during the last year and a half. Mention is made of this because of the fact that the use of spinal anesthesia and a left rectus incision have permitted exposure of the lower end of the esophagus more easily than the fundus of the stomach. In such cases the question has been frequently raised as to the effect of the loss of the entire stomach on the general physiologic processes. In this respect it may be noted that one of the patients successfully operated on by W. J. Mayo[2,3] lived for almost four years. Moynihan[4] and Brigham[5] each reported a case in

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[1] Balfour, D. C.: Annual Report of Surgery of the Stomach and Duodenum for 1930. Proc. Staff Meetings of Mayo Clinic. 8:55-59, Jan. 28, 1931.

[2] Hartman, H. R.: Blood Changes in a Gastrectomized Patient Simulating Those in Pernicious Anemia. Am. Jour. Med. Sc., 162:201-206, Aug., 1921.

[3] Mayo, W. J.: Quoted by Hartman.

[4] Moynihan, B. G. A.: A Case of Complete Gastrectomy. Lancet, 2:1748-1752, Dec. 21, 1907.

[5] Brigham, C. B.: Case of Removal of the Entire Stomach for Carcinoma; Successful Esophagoduodenostomy; Recovery. Boston Med. and Surg. Jour., 138:415-419, May 5, 1898.

Physiologic and chemical studies following successful total gastrectomy which I[6] performed September 10, 1929, carried out over a period of four months subsequent to operation, did not reveal any appreciable change in the number of erythrocytes, in the content of the hemoglobin, in the carbon dioxide combining power or in the concentration of blood chlorides or urea. A second case in which I[7] operated successfully, December 30, 1930, is being studied similarly to serve for comparison with the other cases.

PRESENCE OF METASTASIS

The presence of metastasis in the cervical lymph nodes (so-called signal glands) or in the region of the navel, when definitely proved to contain carcinoma cells by excision of the lymph node and its microscopic examination, is in general a contraindication to operation. The same general statement applies to pelvic implants palpated on the rectal shelf on rectal examination. On the other hand, the presence of a small tumor in the liver existing with a carcinoma of the stomach should not be taken to be a metastatic nodule unless proved so by microscopic examination of a section removed from it. Furthermore, I am not convinced that metastasis in the liver of a patient in good condition should prevent the palliative removal of an ulcerated, infected gastric lesion. There is no reason why such a necrotic, sloughing tumor and the relief of actual or impending obstruction should not be removed, if by so doing the remainder of the patient's life may be made more comfortable. In this connection it should be remembered that death due to metastasis to the liver is usually painless, probably because the metastatic hepatic lesions do no break down or become infected. Whether or not such a palliative resection should be done is a problem to be decided on in each individual case, yet the principle established by Sampson-Hanley in his treatment of carcinoma of the breast, in my opinion applies equally well to the treatment in cases of gastrointestinal carcinoma, which briefly is that we should extend our field of usefulness not only to include the early cases of malignancy, but also the late cases and the recurring cases, if by so doing we can make the remainder of the patient's life more comfortable.

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[6] Walters, Waltman: Physiological and Chemical Studies Following Successful Total Gastrectomy for Carcinoma. Jour. Am. Med. Assn., 95:102-106, July 12, 1930.

[7] Walters, Waltman and Priestley, J. B.: Total Gastrectomy and Other Extensive Gastric Resections in Elderly Patients. Proc. Staff Meetings of Mayo Clinic, 8:49-51, Jan. 28, 1931.

PARALYTIC ILEUS *

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The purpose of this paper is to bring together in condensed form the literature up to date on paralytic ileus and to set forth the views of some recent investigations along this particular line. The term ileus, generally speaking, is used in this paper to mean both paralytic and obstructive, as the differential diagnosis between paralytic and obstructive postoperative ileus is not always possible previous to institution of treatment, and the emergency of the situation precludes the methods for accurate differential diagnosis with accompanying delay. The major part of the paper will be devoted to a discusion of the etiology of paralytic ileus, with a review of the anatomy and physiology of the autonomic nervous system and its relation to the condition, with a summary of the most efficient and recent methods of treatment.

From an etiologic standpoint, we must consider ileus of three different types.

1. Delayed postoperative ileus, in which we have to deal with adhesions. On postmortem examination of cases of general peritonitis one sees the great tendency of the profuse lymph-adhesive exudate to bind coils of intestines together to form kinks. Wilkie,[1] quoted by Estrem, said that, in a review of the postmortem examination of a large series of so-called general peritonitis deaths occurring five to ten days after operation for acute appendicitis, intestinal obstruction accounted for seventy-five per cent of the cases, and it has been proven that quite recent lymph adhesions in these cases are sufficient to cause fatal intestinal obstruction.

2. The organic type, in which we have such diseased conditions as annular carcinoma as the causative factor. It will not be necessary to discuss in any detail the part that organic disease plays in intestinal obstruction. The clinical picture and end-result are the same unless the obstruction is removed.

3. The immediate postoperative, in which infection and trauma are the exciting causes.

Moynihan[2] says, "postoperative obstruction, coming shortly after operation, is almost invariably due to infection, especially from pelvic peritonitis originating in appendicitis or in septic conditions of

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* Read before a Meeting of King County Medical Society, Seattle, Wash., March 2, 1931.

[1] Estrem, C. O.: Postoperative Ileus, Minn. Med., 11: 83-86 (Feb.) 1928.

[2] Moynihan, Berkeley: Textbook, Abdominal Surgery,' 1926.

the pelvic genital organs. He also emphasizes that a limited peritonitis frequently causes a complete paralytic obstruction of the segments of intestines involved, which is so severe that unless dealt with promptly it will soon become fatal. We have definite proof that, where peritonitis is still localized in a single coil of the intestines with infection of the superficial blood vessels and loss of normal luster, and the normal suppleness is changing to a stiffening of the bowel, the paralytic type of ileus may result and produce just as fatal an obstruction as the true organic type."

Besides adhesions, organic disease and infection, there is the type of ileus produced by trauma, which cannot be explained except on a basis of nerve disturbance. It is very evident that rough handling, actual injury to the bowel, extensive manipulation, prolonged exposure to air, and such irritation as extreme hot sponges will produce a form of paralytic ileus. It is mainly from this point of view that this paper was written.

According to Estrem,[3] "There are few emergencies that a surgeon has to meet that are more discouraging than cases of postoperative ileus following a perfectly clean surgical case. In the first place, the keen disappointment that he suffers at the failure of the first operation to relieve his patient and then the necessity for subjecting his patient, in a highly critical condition, to a second ordeal far more hazardous than the first, and the dismay and dread of the patient who has just passed through a difficult seige, produce a situation which requires real courage and prompt decisive action on the part of the surgeon."

Postoperative ileus is encountered, following many various abdominal operations. It is very often found, following a clean case of appendicitis. It rarely occurs in obstetrics, following a difficult delivery. It may also follow injuries. A case is reported, following a blow to the chest which fractured three ribs. A number of cases of ileus are reported, following a severe blow to the abdomen. In fact, it appears that it may occur in any condition which would disturb the balance of the autonomic nervous system.

The great majority of cases follow operations for acute appendicitis and pelvic conditions, and it has been the observation of many surgeons that many postoperative obstructions are found near the ileocecal valve and in the pelvis, perhaps due to the fact that a relatively large proportion of abdominal operations are in the lower abdomen. High intestinal ileus, however, may occur after any abdominal operation, but is probably more often encountered following operations on the stomach.

Estrem says, "the clinical picture of a moribund postoperative case of ileus, whether paralytic or obstructive, is essentially the same. The condition is that of a profound toxemia with some of the added symptoms of shock. There is great prostration and evidence of dehydration. Usually there is vomiting; this is not projectile or forceful, but rather a weak gulping up or slopping over of an overfilled stomach; the vomitus is a dark and foul regurgitation from stomach and duodenum. The abdomen may not be greatly distended and there may not be much abdominal pain unless there is peritonitis present. The blood pressure drops and the pulse becomes rapid, weak and thready. The skin becomes moist and clammy. There are muscular twitchings and occasionally tetany. There is suppression of urine; and a drowsy, semicomatose state of mind develops."

Many opinions have been advanced to account for the frequency of ileus after abdominal operations and its complete absence in cases where operative conditions seem to be similar. From all observations reported in the literature the traumatic type of ileus can probably be best explained by a disturbance of the balance of the autonomic nervous system.

At this point it will probably be fitting to make a brief review of the anatomy and physiology of the autonomic system, and to advance some recent theories regarding the relation of trauma to paralytic ileus. In the first place, the walls of the intestine are supplied by the sympathetic and parasympathetic systems, terminating in the nerve plexuses of Auerbach and Meissner. In addition, the sympathetic nerve with the plexuses act as inhibitory motor nerves of the stomach and intestines, while the vagus nerve supplies the exciting fibers to the digestive apparatus. It also contains some sensory conductors from the spinal fibers. With the sympathetic we link the splanchnics and with the parasympathetic the vagus nerve. In other words, we have an antagonistic dual innervation of the intestines by the vagus and splanchnic nerve fibers. Stimulation of the vagus nerves produces a motor effect, whereas stimulation of the splanchnic tends to produce an inhibitory effect. From this we can conceive how paralytic ileus could be produced by trauma through a reflex inhibition of bowel movements.

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[3] Loc. Cit.

Starling[4] states that "stimulation of the splanchnic nerves causes complete relaxation of the intestines, while stimulation of the vagus increases contraction, following a brief period of relaxation." He also suggests that the relaxed condition of the intestines in many abdominal conditions is probably due to a reflex stimulation of the splanchnic nerves which nullifies the motor action of the vagus. We can, therefore, see how these reflexes from rough handling, exposure to cold air, extreme heat, etc. might produce a paralysis of the intestines.

It is from this standpoint that splanchnic and high spinal anesthesia offers such encouraging results in the treatment of ileus. The splanchnic analgesia interrupts the fibers of the splanchnic nerves at the point at which they break up into synapses which occur in the celiac or semilunar ganglia, i.e., the connection between the pre- and postganglionic fibers of the splanchnic nerves. In other words, it tends to prevent impulses from reaching the intestines by way of the splanchnics, which would in turn give the vagus motor impulses full play. The celiac or semilunar ganglia, just mentioned, lie in the epigastric region of the abdomen behind the bursa omentalis and the pancreas, in the region of the origin of the celiac and superior mesenteric arteries. It is joined by the great and the lesser splanchnic nerves of both sides, by celiac branches of the right vagus, and by filaments from the upper lumbar ganglia of the sympathetic trunks.

In ileus following peritonitis it is probably the direct effect on visceral reflexes, combined with the effect of toxemia, which is held to develop sympathetic overactivity as the cause. In any event the bowel is atonic and function ceases. There is considerable discussion at the present time as to whether distension of the intestines or the toxicity of the contents is the primary factor of danger. Some investigators contend that, if the pressure from within the gut is kept low, an animal with complete obstruction of a segment will remain normal for long periods of time. When the tension rises, however, various serious consequences follow in rapid succession. First, there are initiated rapid visceral reflexes, of which vomiting is a prominent feature. This leads to rapid dehydration, loss of chlorides and the symptomatology of anhydremia. The increasing pressure in the gut may lead to interference in the blood supply to a portion of the gut, followed by gangrene and rupture. However, long before the pressure threatens the integrity of the wall there are set up serious reflexes, and as the distension increases, the muscle is less and less able to resume function. From all the evidence we have at hand it appears that the danger lies in a combination of the distension and toxicity of the intestinal contents.

The treatment of the paralytic ileus has always been unsatisfactory and the mortality from acute intestinal obstruction has fallen very little during recent years. The death rate after operation in early cases is not less than twenty per cent, while in any large collection of cases it may reach fifty per cent.

The efficacy of drugs, such as castor oil, calomel, pituitary extract, etc., are no doubt of some benefit when used to supplement other treatment but their action depends on contraction of the bowel. If the bowel is paralyzed, these drugs will fail to act and will add to the strain on the heart, already damaged by toxemia. Enterostomy in the paralyzed bowel in such cases only drains the affected loop, and, therefore, is of but limited value. It is, therefore, apparent that in cases of paralytic ileus attempts to stimulate peristalsis in the bowel should be avoided. The most effective measure is to give it complete rest and thereby a chance to recover its power of active contraction.

The treatment of paralytic ileus must be considered from two different points of view, i.e., the preventive and symptomatic treatment. The preventive treatment involves the ability to properly diagnose the case early, before unfavorable conditions occur, i.e., (1) removal of the appendix before it has perforated, (2) avoiding use of excessively hot sponges, (3) careful handling of the gut, (4) minimum exposure to cold air. Another important step in preventive treatment is the selection of the proper type of anesthesia which appears to be high spinal or splanchnic. This anesthesia gives perfect relaxation and allows manipulation of the distended coils of bowel to be carried out with ease.

Bier[5] reports a number of cases of spastic ileus that were operated upon under spinal anesthesia, and active peristalsis took place during the operation, resulting in a complete cure of the condition.

Kappis,[6] in 1920, performed several successful abdominal operations by direct injection of the celiac ganglion with a novocaine solution. Oschner, in a recent article, reports twelve cases of ileus which he treated successfully with splanchnic analgesia. In most of these the ileus had been present for several days.

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[4] Starling, E. H.: Textbook, Physiology, 1926.

[5] Bier, A. Cited by Rosenstein, P.: Therapeutic Attempts to Prevent Intestinal Paralysis by Injection Around the Celiac Ganglion. Med. Klin., 22:530-533, 1926.

[6] Kappis, Cited by Ochsner, A., Gage, I. M. and Cutting, R. A.: The Treatment of Ileus with Splanchnic and Spinal Anesthesia. Anesth. and Analg., 9:91-94 (March-April), 1930.

For the symptomatic treatment of paralytic ileus at the present time we would not go far wrong, if we followed those methods as employed by Ward.[7] He launches his therapeutic attack against the elimination of the cause and against the four handmaidens of peritonitis, as he terms them, which are gastric dilatation, ileus, toxemia, dehydration.

His treatment may be summarized as follows:

"1. Elimination of cause with as little manipulation and trauma as possible, which means without drains which act as foreign material.

"2. Continuous transnasal duodenal and gastric drainage and frequent saline lavage during the stage of dilatation and ileus. This is to be instituted at the first sign of distension and continued until the tone of the bowel is restored, as shown by the rapid absorption of saline solution introduced through the tube.

"3. The administration of large amounts of normal saline solution beneath the skin to maintain fluid balance and proper level of blood chlorides.

"4. Morphine and opium as demanded for comfort, quiet and peristaltic inactivity.

"5. Maintenance of a comfortable position, usually the semi-Fowler, with application of moist external heat to abdomen.

"6. Nourishment, if given at all during ileus, consists of glucose per rectal drip which also means a way of getting rid of flatus."

It has been definitely shown that there is a marked drop in the blood chlorides in intestinal obstructions. Haden and Orr's work on blood chemistry has been recognized, and their methods of combating toxicity in intestinal obstruction have been put in effect and we have come to realize more than ever the value of the sodium chloride intake.

Ward feels that, after eliminating the focus, the most important thing is the continuous gastric and duodenal lavage. He reports that he has not had a single death in the past four years from peritonitis not complicated by pneumonia, septicemia or some similar disease, where he has used the continual duodenal and gastric lavage. He feels that a tremendous amount of good can be done as soon as this procedure is universally adopted.

Note: I wish to acknowledge my indebtedness to Dr. D. H. Nickson, Seattle, and Dr. W. K. Livingston, Portland, for their suggestions in the preparation of this paper.

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[7] Ward, Robertson: Acute General Peritonitis, Calif. and West. Med., 395 (Dec.), 1929.

INJECTION TREATMENT OF VARICOSE VEINS*

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About fifteen months ago I published an article[1] on this subject, which I now find is completely out-of-date. The technic previously described has been discarded. Two years ago the procedure was more or less in the experimental stage, at least in this country. Now it rates as a safe and effective therapeutic procedure, which the alert physician has taken up with a great deal of satisfaction to both himself and his patients.

The literature is full of reports comparing the operative treatment with the injection method, and everywhere the conclusion is the same, namely, that viewed from every angle the results are overwhelmingly in favor of the injection treatment. So true is this that the operative treatment has practically been discarded, while many improvements have been made in the injection field. The technic has been simplified so that complications are fewer. We now know more about what complications are to be looked for and how to guard against them or how to treat them properly when they occur.

Etiology. Many patients ask the question, "What causes varicose veins?" This question cannot be answered point bank. There is generally a weakening of the valves in the external iliac veins which allows a back pressure to develop against the valves in succession. The valves then successively give away against this back pressure and the vein becomes dilated throughout its entire length. Any obstruction to the return flow of blood from the extremity would tend to increase the back pressure and weaken the valves. Such obstruction might be caused by circular constriction around the extremities, as from garters or elastic in bloomers, or by any increase in intraabdominal pressure, as from abdominal or pelvic tumor or even chronic cough or chronic constipation.

This theory satisfactorily explains the etiology of many varicose veins, but it falls down in many other cases. There is considerable evidence being accumulated at the present time to indicate that the development is associated with a disturbance in the endocrine system. Many patients date the onset of their symptoms to puberty, and we often see women who complain that their veins get worse at the time of their menstrual periods. These facts, coupled with the well-known association of varicose veins with pregnancy, lend weight to the endocrine theory. de Takats[2] has found heredity a factor in 65 per cent of his cases.

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*Read before a meeting of King County Medical Society, Seattle, Wash., Jan. 19, 1931.

[1] Edmunds, L. H.: Injection Treatment of Varicose Veins. Am. J. Surg., 8:381-384, Feb., 1930.

Prolonged standing is another important mechanical factor, while exercise, because of the stimulation of the circulation by the sucking and milking action of the contracting muscles, seems to obviate the effect of the upright position. Several cases have been reported where patients who have peculiar occupations, requiring them to stand on one foot and pedal a machine of some sort with the other, have marked varicosities in the leg on which they stand and none in the leg with which they pedal.

Contraindications. There are only two true contraindications to this method of treatment. These are (1) where there is an acute or subacute phlebitis in the veins to be treated, and (2) where there is a history or evidence of a preceding thrombophlebitis, which has obliterated the deep veins. There are many other instances in which it is unwise to attempt the treatment, but these are the only real contraindications. For instance, it is exceedingly unwise to attempt to obliterate the vein where there is a definite disturbance of the arterial circulation in the extremity, such as occurs in Buerger's disease, senile arteriosclerosis, or the arteriosclerotic process associated with diabetes mellitus. The reason here is that gangrene is imminent in these cases, and most patients are so constituted that they will always attribute the development of gangrene to the injection rather than to their preexisting disease, no matter what amount of scientific evidence is produced against them. Therefore, the pulsation in the dorsalis pedis, posterior tibial and popliteal arteries should be determined beforehand. It is also unwise to attempt treatment in extreme old age, in advanced cardiorenal disease, malignancy or tuberculosis, or in any patient who has a condition more urgent than his varicose veins. Diabetes is not considered a contraindication. Several of our cases associated with diabetes have been attended with marked success, and in none have untoward complications arisen.

To test for the patency of the circulation in the deep veins, Perthe's method is probably the simplest and most satisfactory. The patient is allowed to stand up so as to distend the veins. A blood pressure cuff is then thrown around the thigh and pumped up to a pressure of 45-50 mm. of mercury, in other words, to a pressure just sufficient to shut off the superficial veins but not the deep ones. The patient is now asked to walk about the room for two or three minutes. If the deep circulation is patent, the distention of the superficial veins will decrease with the exercise, but they will immediately distend again when the blood pressure cuff is deflated. However, too much importance must not be placed on this test, for if the patient is up and around, with marked superficial varicosities and with hardly any swelling of the ankles, then we know without testing that the deep circulation is functioning satisfactorily.

Chemical Irritants Employed. In selecting a preparation suitable for obliterating the veins the essential factor is that an irritant of the vein intima and not a coagulant of the blood be employed. Blood coagulants are both ineffective and dangerous and should never be used. Literally hundreds of chemical irritants have been tried. Most of these have been discarded. Our experience has been limited to four of these: sodium salicylate, sodium chloride, the sugar solutions, and quinine hydrochloride and urethan.

Sodium salicylate was made popular by the work of Sicard of France. Purely for its effect in obliterating a vein I do not believe any solution has ever been developed which is superior to sodium salicylate. However, there are two distinct objections to it. First, it causes, at the time of injection, a severe painful cramp which is sometimes very excruciating. True, this does not last long, but some patients dread it so that they will either refuse further treatment or go elsewhere for it. Second, if even a small amount is allowed to leak into the tissues outside the vein, it usually will result in a slough.

What has been said of sodium salicylate is also true of sodium chloride but to a lesser degree. It is very effective in obliterating the vein, but it likewise causes severe cramps and is apt to produce a slough in the perivenous tissue. I do not believe these two should be discarded completely. They have a distinct place in the injection treatment, but I believe their use should be confined to the large leathery, resistant type of veins, which are so difficult to obliterate with milder irritants.

The sugar solutions, dextrose, calorose, invertose, etc., are much milder than the sodium chloride or salicylate. They cause only a mild cramp or none at all at the time of injection. If small amounts leak into the perivascular tissue, they do not cause a slough, they have no systemic effect and can be used in any desired amount except when associated with diabetes mellitus. They have the disadvantage of being very thick solutions with high viscosity. This makes the technic of administration more difficult and the chance for leakage greater.

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[2] de Takats, Geza, and Quint, Harold: The Injection Treatment of Varicose Veins, S., G. and O., 50:545-561, March, 1930.

The injection with these solutions takes several minutes, even when using a fairly large needle, and the longer it takes the greater is the chance of slipping outside the vein after a perfect start. A little change of position by the patient or a trembling of the administrator's hand, and this naturally occurs after two or three minutes, is frequently all that is necessary to displace the needle. A large needle also has the disadvantage of causing greater discomfort to the patient and offering a greater opportunity for the leakage of both blood and irritant through the puncture wound in the vein.

In my opinion we have in quinine hydrochloride and urethan the best preparation for the ordinary run of veins. Its injection is painless, it does not cause slough when introduced into the perivascular tissue in small amounts, it is very effective in obliterating the vein, and it is very easy to administer. Since only a very small amount is given at one time, a fine needle can be used, and once the vein is entered the injection is made and the needle withdrawn in less time than it takes to tell, and there is not much chance to go wrong. Its disadvantages lie in the fact that only small injections can be given at one sitting, that occasionally idiosyncrasies to quinine are encountered, and that it should never be given during menstruation or pregnancy.

To summarize this discussion on the solution to be employed, I might say that quinine hydrochloride and urethan are used for the ordinary run of veins. The sugar solutions are used during menstruation and pregnancy and when for various reasons it is desirable to push treatment rapidly and hence give numerous injections at one sitting. The sodium chloride and salicylate are reserved for the large leathery, resistant type of veins, which the sugar solution will not obliterate and which would require too large an injection of quinine hydrochloride and urethan for safety.

Technic. The equipment necessary is very simple. Ordinary Luer syringes and needles are all that is necessary. Some men prefer to make the injection with the patient standing, while others prefer the supine position. The supine position is certainly more advantageous as far as the effect on the vein is concerned, for in this position it is not distended with blood and hence the solution is not greatly diluted. Furthermore, the flow in the vein is practically at a standstill and the irritant will have plenty of time to get in its effect on the vein. This position is also much more agreeable to the patient and more comfortable to the physician. The obvious objection to it, however, is that it is sometime impossible to enter the vein in the horizontal position. Then from necessity rather than from choice we must stand the patient up so that the veins will be distended, when the needle is inserted. It is absolutely essential that the injection be made into the vein. Outside the vein it will not only do no good but is painful to the patient and will frequently result in a slough.

After the injection a cotton sponge should be held firmly over the site of the puncture for two or three minutes to prevent leakage through the wound. The leg is then bandaged firmly with a cotton elastic bandage. We have found the Becton Dickinson ace bandage about the most satisfactory for this purpose. This localized compression of the veins after the injection is for the purpose of producing stasis in the vein, which is an important factor in thrombosis; second, for reducing the back pressure of the column of blood; and, third, for approximating the injured intimal surfaces so that when a thrombus is formed it will be a small one and will take much less time to organize than a large one.

When the injection is over we like to have the patient walk a little. This will serve to drive the irritant out of the injected veins and into the general circulation, where it is so diluted that its effect will be negligible. This will preclude the possibility of the gradual seepage of the irritant from the superficial to the deep system, thus obliterating the deep veins.

Within twenty-four hours of the injection an inflammatory reaction develops along the course of the vein. This is ordinarily quite mild and causes little inconvenience, but occasionally it is rather severe and painful, although I have never seen it so severe as to require the patient to go to bed. It is well to provide the patient with a few analgesic tablets in case it is painful. The inflammation subsides after two or three days.

Where the injection is successful a thrombus rapidly forms in the damaged vein. Organization proceeds very rapidly and is usually complete after about three weeks, after which the vein can be palpated as a firm fibrous cord running up the leg. After several months this cord is gradually absorbed and replaced by scar tissue.

Injections are generally made from one to three times a week. At the first injection it is wise to inject only one vein and to use only a small dose. Particularly is this true of quinine hydrochloride and urethan, where the initial dose should never exceed one-half a cubic centimeter. With a small dose we can test out the individual's idiosyncrasy to the drug and the reaction of the vein. If everything goes smoothly, we can increase the dose at the next injection. The amount of quinine hydrochloride at a single injection should not exceed two cubic centimeters. Never should more than four be given at a single sitting. If further injections are desired at a sitting, use some other drug than the quinine. It is impossible to tell beforehand how many injections will be necessary for a cure, for veins react differently to the irritants. In some patients a small dose will affect the entire length of the vein, while in others it will obliterate only a small segment. Six to eight injections will usually suffice for the average case.

Complications. The first complication we may meet is from the injection outside the vein. This is manifested by an intense burning at the site of injection. If this occurs, a slough can usually be prevented by injecting 5 to 10 cubic centimeters of distilled water into the injected area. If, however, it is evident that a slough is imminent, it is best treated by excision of the damaged tissue and primary closure of the wound. In this way we frequently get first intention healing, where otherwise the slough would be from three to six months in healing.

A second complication, which is more theoretical than real, is a pulmonary embolus. Sicard and Gaugier reported 15,000 cases, Forrestier 5000, Genevrier 4000, and Meisen 2000, without a single instance of pulmonary embolus.[3] In fact, McPheeters and Rice,[4] in reviewing some 53,000 injections, found only four authentic cases of embolism. Furthermore, after thoroughly going over these cases, they believe that in all four injections were made in the presence of an acute though latent phlebitis, a procedure which is always contraindicated. An infectious phlebitis always holds the possibility of an embolus, but it is their opinion that a chemical phlebitis will never extend beyond the injured vein. If the contraindications previously given are observed, I do not believe the danger of embolism is as great as from a hemorroidectomy, a herniotomy, or even the reduction of a fracture.

Another complication which is occasionally encountered is a painful chemical cellulitis, which is due to some of the solution passing through a thin-walled vein by osmosis. This, however, responds quickly to heat applied locally followed by a light ace bandage. Of course, it is always possible to introduce infection into the tissues with the needle, and this may lead to serious and embarrassing complications. Observing a strict aseptic technic will eliminate this.

End-results. About 10 to 15 per cent of cases will result in failure. All cases are classified as failures, where the veins treated are not obliterated permanently. Failures can usually be placed in two groups. In the first are those, in which the long saphenous vein is greatly dilated and the valve totally incompetent and in which back pressure causes canalization of the thrombus after it has once been formed. In the second group are those with large saccular dilatations, with the intima already damaged, in which extensive scar formation has taken place. deTakats recommends as a remedy for the much dilated wide open saphenous, ligation at its highest palpable point in the thigh. This can be accomplished easily in the office under local anesthesia, with a small incision. The patient is not required to go to bed and need remain from work for only twenty-four hours. The obvious remedy for the second group, those with large saccular dilatations, with damaged intima and extensive scar formation, is the use of more irritating solutions, such as sodium salicylate or sodium chloride.

So far nothing has been said in regard to varicose ulcer. This is one of the more serious complications of varicose veins and is readily amenable to treatment by the injection method, combined with measures to support the circulation in the extremity. Varicose ulcers are due primarily to a reversal of the flow of blood through the saphenous vein, with a stagnation of blood in the tissues and with a consequent lowering of their resistance to infection. Usually one or more large dilated feeder veins can be found in close proximity to the ulcer. These keep the ulcer area in a markedly edematous condition, where the nutrition to the tissues is very poor.

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[3] Stuebner, R. W.: Varicose Veins and Their Treatment by the Injection Method. S., G. and O., 51:169-182, Aug., 1930.

[4] McPheeters, H. O. and Rice, Carl O.: Varicose Veins. J. A. M. A., 91:1090-1094, Oct. 13, 1928.

We believe these ulcers are best treated by the injection method to obliterate these feeder veins, at the same time applying a tight ace bandage to support the circulation in the extremity. Ordinary gauze sponges should be applied in sufficient numbers over the ulcer to absorb the secretions. The support with the ace bandage is effective, and it is easily and quickly applied. For this reason it can be removed daily if necessary, the ulcer inspected, an injection made, the dressings changed, and the bandage reapplied. The Unna cast, which is highly recommended by some, is equally effective in supporting the circulation, but it has the disadvantage of requiring a great deal more time and trouble for its application and of being much more expensive to the patient in cases where frequent changes are necessary.

The great advantage in this method of treatment of ulcer lies in the fact that the patient is ambulatory. Rest in bed is not required and, moreover, is not desirable. The patient should walk, for with the circulation supported, walking will greatly increase the flow of blood through the extremity, increase the nutrition to the parts, and aid the healing process. The support to the circulation with the compression bandage must be continued throughout the entire course of treatments and for a long time after the ulcer has healed.

Role of Community Clinics in Mental Hygiene.—According to George S. Stevenson, New York (*Journal A. M. A.*, March 28, 1931,) the mental hygienist in developing his preventive and early treatment program is confronted with a more complex situation than the physical hygienist in that his subject, man-as-a-whole as contrasted to his parts, is a free moving agent which is constantly changing its relationships and inducing responses from people on a variety of grounds. Prevention is mental hygiene work, hence has been sought not only in medicine but also in criminology, social service, pedagogy and religion, and a successful community effort must coordinate these varied approaches. Mental hygiene consequently depends on the willingness and capacity for cooperation of a number of co-equal groups, no one of which can assume too much authority. This entails an extensive improvement in professional education so that the teacher will teach better, the social worker and public health nurse will do their jobs better, the judge will plan better for his cases, the minister will guide better, and the physician will see his problems with their broader implications. This last means a new shading, not an added subject to medical education. The mental health activities of a community cannot get ahead of these advances in professional training. The clinic can provide service to the few cases whose mental hygiene needs exceed the capacities of other agencies in the community; it can shoulder the jobs of others only temporarily and pending the development of these capacities. Beyond clincal service, it carries a responsibility for community education and organization.

MATERNAL MORTALITY IN OREGON*

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The problem of reducing maternal mortality in Oregon leads us first to a consideration of the present maternal death rate; second, to an analysis of the significant results that have been obtained at the University of Oregon Medical School obstetric clinic; and third, to a discussion of measures that might reduce maternal mortality. By maternal deaths are meant those which are due primarily to causes connected with pregnancy and childbirth. Deaths arising from other causes, in which pregnancy or childbirth are only contributing factors, are not included.

The trend of maternal mortality is shown by the comparative figures found in Table 1.

Table 1

DEATHS FROM CAUSES ASSOCIATED WITH PREGNANCY AND CHILDBIRTH

Area—	Period	Maternal Mortality Rate Per 10,000 live births
Birth Registration Area	1924 to 1929	66.2
*Oregon	1924 to 1929	64.2
University of Oregon Obstetric Clinic	1924 to August, 1930	25

*Maternal death rate in State of Oregon excluding abortions, 48.

While the maternal death rate for Oregon does not vary much from that of the United States at large, the results obtained at the University of Oregon obstetric clinic showed a marked reduced rate. These figures are of greater significance than appear on the surface, when one considers that the economic status and social backgrounds of the patients would normally make them greater risks.

The United States Children's Bureau, in collaboration with the Oregon State Board of Health, made a survey of the maternal deaths of Oregon for the year 1928. The following summarized statement of the survey was presented to the State Medical Society and the Oregon State Board of Health.

SUMMARY

One hundred and seventy-seven women died of causes connected with pregnancy and childbirth in Oregon in 1927 and 1928. The case histories of these women were studied by interviewing the attending physicians. The maternal mortality rate was 62.5 per 10,000 live births.

Seventy maternal deaths, or 40 per cent, were found to have been due to puerperal sepsis. Sixty-four per cent of the deaths from sepsis followed abortions; thirty-seven per cent of the deaths from sepsis followed induced abortions. Forty-one, or 23 per cent of the maternal deaths, were classified as due to puerperal albuminuria and convulsions, which includes toxemia of pregnancy. Only seven of these patients had good prenatal care and only four were cooperative; three of them were delivered by cesarean sections, with toxemia as the indication, and one by forceps after a bag dilatation of the cervix.

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*From the Department of Obstetrics, University of Oregon Medical School.

* Read before the Annual Meeting of City and County Health Officers, Portland, Ore., Sept. 17, 1930.

Forty-six per cent of the whole group died before, and 54 per cent after the seventh month of gestation. Thirty-three per cent of the whole gave birth to living children and 34 per cent of the deaths followed abortions, including 15 per cent that followed induced abortions.

Twenty-nine per cent of those, who could have been expected to have prenatal care and for whom there was a statement as to this, did not consult a physician until time of delivery or until the onset of serious symptoms shortly preceding death. These were classed as having had no prenatal care. An additional 41 per cent had had very unsatisfactory prenatal care. Twenty-two per cent, however, had had rather good medical prenatal care. Obstetric operations had been performed on about forty per cent of those who died.

More than half of the physicians attending the deliveries of these women reported that they had used aseptic technic. All but eight of those reporting on the use of rubber gloves had used them. Pituitrin was used in 57 per cent of the deliveries for which this question was answered, but used before the expulsion of the child in only 13 per cent.

Seventy-two per cent of the deaths occurred in hospitals. Fifty-eight per cent of the women who died at or after seven months gestation reached the hospital before delivery. Thirty-two women who died had planned hospital deliveries.

Table 2 is a tabular representation of the deaths from pureperal causes.

In our service at the Multnomah County Hospital and outpatient clinic in connection with the University of Oregon Medical School, there were five maternal deaths due to puerperal causes and five deaths due to other causes in which pregnancy was a complication (table 3).

Table 2

WOMEN WHO DIED FROM PUERPERAL CAUSES

	As certified in death certificate for State of Oregon		Obstetric Clinic University of Ore. Medical School	
Cause of death	Number	Percentage distribution	Number	Percentage distribution
Total	179	100	5	100
Accidents of pregnancy	25	14	0	0
Puerperal hemorrhage	23	13	4	80
Other accidents of labor	13	7	0	0
Puerperal septicemia	69	39	0	0
Puerperal phlegmasia alba dolens, embolus, sudden death	7	4	1	20
Puerperal albuminuria and convulsions	42	23	0	0
Following childbirth (not otherwise defined)	0	0	0	0

Table 3

UNIVERSITY OF OREGON OBSTETRIC SERVICE

	Maternal deaths based in 2060 deliveries	
	Prenatal care	No prenatal care
Total	4	6
Puerperal Causes		
Abruptio placentae	1	1
Pulmonary embolism	0	1
Puerperal hemorrhage	0	0
Ruptured ectopic	1	0
Hemorrhage following cesarean	0	1
Accidental		
Pneumonia	2	0
Cancer	0	1
Hodgkins disease	0	1
Acute miliary tuberculosis	0	1

Beck, at Long Island County Hospital, in a series of 3,000 cases of multiparous deliveries, reports but three maternal deaths. Results such as these are being duplicated in many clinics of this country, where the work is done by supervised students, interns and resident interns. If it is possible to obtain results such as these in clinics which are altogether among the poor, then it is possible to obtain results approaching the above in the state as a whole.

Let us examine some of the causes of high maternal mortality as shown in the summary. It is stated that 22 per cent had had good prenatal care. Prenatal care, as described in "Standards of Prenatal Care" (U. S. Children's Bureau Publication No. 153), may be summarized as including a careful history, medical, surgical, gynecologic and obstetric; a complete physical examination, including the examination of the heart, lungs and abdomen; pelvic measurements, both internal and external; the taking of blood for a Wassermann reaction; minute instructions in the hygiene of pregnancy, and visits to a physician at least once a month during the first six months, then more often as indicated, preferably every week in the last four weeks. At each visit to the physician the patient's general condition must be investigated, blood pressure taken and reported, urinalysis done, pulse and temperature recorded, the weight of the patient taken if possible, abdominal examination made and the height of the fundus determined.

One of the two women who died, in spite of this grade of care, died of a pulmonary embolism on the ninth day of an apparently normal puerperium. The other died of eclampsia after a cesarean section. The latter had had eclampsia at her four preceding deliveries. This would leave 78 per cent who had had inferior care or none at all.

Forty per cent of the deaths were due to puerperal sepsis and sixty-four to sepsis following abortion. Sepsis as a cause of death is and will remain our most difficult problem. So long as women will risk their lives by having abortions performed and so long as physicians continue to curette the infected uterus, breaking down the protecting wall of leucocytes and opening wide the blood vessels so that virulent organisms may invade the blood stream, causing general sepsis and death, there will be very little decrease in maternal deaths from this cause.

Twenty-three per cent of the maternal deaths were due to albuminuria and convulsions, or eclampsia. From our experience at the obstetric clinic at the University of Oregon, where grade "A" prenatal care is practiced, this 23 per cent has been eliminated, as up to this time we have had no deaths due to eclampsia. This has been accomplished by frequent examination and observation of the patient and beginning treatment of the toxemia by rest in bed, elimination, a diet of milk and carbohydrates, and in the serious cases the use of intravenous glucose and magnesium sulphate. A large percentage of cases improve, overcome their toxemia and reach full term and normal delivery. In cases that do not improve and the child is viable, the pregnancy is terminated.

As I said above, in this series of cases there has not been one death due to eclampsia and, furthermore, there has not been one eclamptic convulsion previous to delivery in any case that had had grade "A" prenatal care. Table 4 shows the correlation of prenatal and absence of prenatal care to toxemia.

It is very difficult in this clinic to show students cases of eclampsia. Within the past year we have had at the Multnomah County Hospital but two cases of eclampsia, neither of which had prenatal care.

Accidents of pregnancy accounted for 13 per cent of maternal deaths and covers a miscellaneous group of cases. Without having definite information in regard to each case, one is not justified in making comment.

Table 4

PREECLAMPTIC TOXEMIA IN RELATION TO PRENATAL CARE AND NO PRENATAL CARE

	Prenatal-care		No prenatal care	
	Number	Percentage distribution	Number	Percentage distribution
Cases seen	1200	83.3	300	16.7
Preeclamptic toxemia	24	2.0	10	3.3

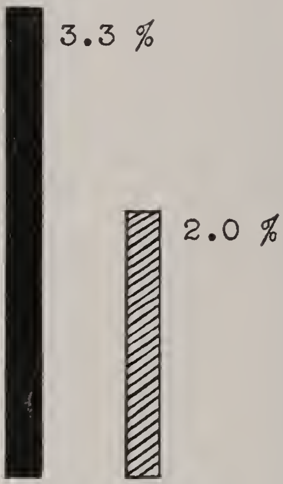

Table 4
Preeclamptic toxemia

Fourteen per cent of the deaths were due to prenatal hemorrhage. This high mortality from hemorrhage shows the necessity for preparedness and alertness on the part of the physician in giving early blood transfusion. Such alertness was exhibited by one of our physicians in central Oregon, who at one o'clock in the morning had forty-five persons waiting at his office to have their blood typed as donors for a case of postpartum hemorrhage. The patient in question recovered.

What can be done to reduce this maternal mortality? May we suggest the following.

Education of the laity. Considering that 22 per cent of prospective mothers are now receiving grade "A" prenatal care, four-fifths remain to be educated. Excellent work has already been done by the Oregon State Board of Health through its Bureau of Child Hygiene which furnishes valuable information to every expectant mother applying for it.

Health officers, with the cooperation of their public health nurses, have a wonderful opportunity to extend this work by daily contacts and talks before mothers' clubs. This might be extended to include carefully prepared talks to girls in the senior classes in high school.

Increased clinical teaching of medical students. At the present time our medical students spend one-half term at the prenatal and postpartum clinics. They observe and assist in delivery of fifteen cases. As interns the number of cases they deliver and assist at delivery varies, but will seldom exceed thirty cases. That amount of training is entirely inadequate to allow a physician to go out and assume the responsibilities of an obstetric practice. I believe that every licentiate should have at least one hundred cases to his credit under supervision, before he is considered safe to assume such responsibilities.

Table 5

OBSTETRIC CLINIC UNIVERSITY OF OREGON MEDICAL SCHOOL

Fetal and Neonatal Deaths

	Prenatal-care		No prenatal care	
	Number	Percentage distribution	Number	Percentage distribution
Total deliveries	1200	80	300	20
Deaths	29	2.2	13	4
Causes	29	100	13	100
Preeclamptic toxemia	4	13.7	3	23.0
Abruptio placentae	5	17.2	5	38.0
Leuetics	2	6.8	1	7.6
Accidents of pregnancy	10	34.4	1	7.6
Other causes	8	27.4	3	23.0

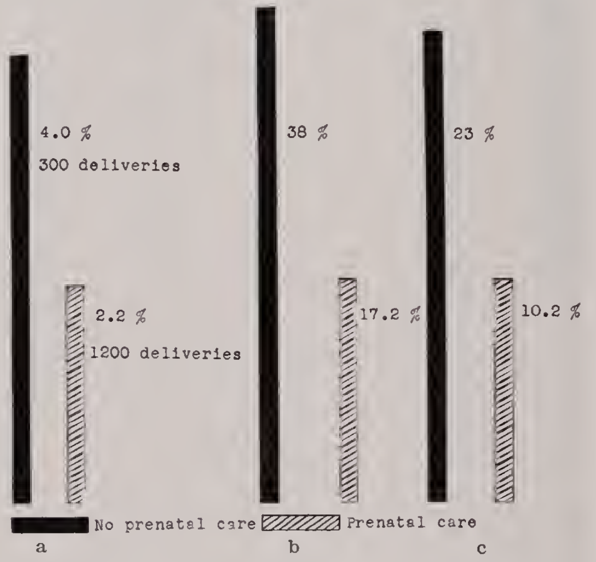

Table 5

a. Fetal deaths.
b. Fetal deaths due to abruptio placentae.
c. Fetal deaths due to preeclamptic toxemia.

Table 6

Fetal and Neonatal Deaths

	Number	Percentage distribution
*Total deliveries	1500	100
Deaths	42	2.8
Causes of death	42	100
Preeclamptic toxemia	7	16.6
Abruptio placentae	10	23.8
Accidents of pregnancy	11	26
Leuetics	3	7.1
Other causes	11	26
Cancer		
Hodgkins disease		
Diabetes		
Hypertension		
Smallpox		
Meningitis		
Bodily injuries		

*Case with complete records in regard to prenatal care.

Nurses. There is a demand and a need for public health nurses who have had special training in obstetrics. The success of the University of Oregon obstetric clinic is due in a large measure to the nurses on the staff. These nurses have contacted each patient in the home, thus acting as an educative home factor. In addition, they have conducted mothers' classes, imparting instructions of invaluable character to our expectant mothers. Needless to say, this type of educational work can be carried on only by nurses equipped with special training.

Hospitalization. The last important factor in reducing maternal mortality is that of hospitalization. The report on maternal mortality in Oregon shows that 72 of the 177 deaths occurred in hospitals; that 56 of the women who died of puerperal causes after completing the seventh month of pregnancy were in hospitals for delivery, but only 32 of these had planned hospital deliveries.

Unfortunately the report omits to state the class of hospitals in which the deliveries took place. There are scattered throughout the state of Oregon over one hundred so-called maternity hospitals, containing from two to twelve beds. Very few of them have graduate nurses in charge. The greater part of them are being conducted by so-called practical nurses. In many instances these hospitals are worse for the patients than if they were confined at home. Many of them are nothing more than primary sources of infection. Septic cases are carried alongside of clean cases by attendants who have had little training in asepsis.

This is a situation that must be remedied. In suggesting a change, something better must be offered. In this case, though it may seem far removed, the answer is community hospitals, maintained by endowments and taxation in each community according to the needs of the people. In each community hospital there should be at least one nurse who has had special training in obstetrics. These hospitals will help solve the problem of adequate medical care as the young physician will naturally go to those communities in which there is a well-equipped hospital.

APPENDIX

The several tables appended to this report further confirm the necessity of prenatal care in also reducing fetal mortality (tables 5 and 6).

Antipoliomyelitis Horse Serum: Preparation and Use—Marcus Neustaedter, New York (*Journal A. M. A.*, March 21, 1931), states that the efficacy of his antipoliomyelitis horse serum and that of Pettit of Paris, who followed his method, was shown in more than sixty cases of frankly paralytic cases of poliomyelitis. The earlier a case is diagnosed the better will be the result of the serum, if given early. Cases presenting a chronic course with elevation of temperature should be afforded the benefit of the serum, which is as harmless as any other antitoxin.

SHOULD THE SPECIALIST'S TRAINING INCLUDE SEVERAL YEARS OF GENERAL PRACTICE*

HUGH A. DOWD, M.D.
IOWA CITY, IOWA

First, let us consider some of the reasons against the specialist taking several years of general practice. After working hard and developing a good general practice, few have the nerve to quit, and start in at the bottom again. This certainly is a valid reason. It is true that at present conditions are not quite fair to the general man who makes the sacrifice and comes back to get some real training under the supervision of masters in his chosen specialty. Such men are not sought by the better postgraduate institutions and are ranked far below the recent graduate. They have a greater difficulty getting such appointments than the recent graduate. If appointed, they must start in where they left off and their general practice is considered against them rather than as worth so much in hospital training. And yet the fellow who will not make this sacrifice does not love any specialty enough to make a good specialist.

We have too many specialists who were formerly in general practice and after a few weeks or months postgraduate work, a new suit, a new car and high powered office nurse, blossom out as specialists. This is true because the public only demand a few months at the Mayos, New York, Chicago, or better a tour of Europe as credentials of an A one specialist.

One is apt to get into ruts and establish bad habits in general practice. One can establish bad habits in a hospital. One mistake in general practice may take years to live down and cost one thousands of dollars, while a good tongue lashing is the rule in a hospital. The rut of not feeling responsible for our patients in a hospital because we are only playing fourth or fifth fiddle is a worse rut. If the family doctor attends medical meetings, keeps abreast of the medical literature and takes postgraduate work once in a while, he will not be very apt to establish ruts.

Why not learn the things that come with the hard knocks of general practice in a more enjoyable way by taking more hospital training? Where can one get this general hospital training at the present time without spending many years to do it? Following our consultation with medical leaders, we will discuss this question further.

Today clinics are the vogue and all each member needs to know is his own line. If you join a clinic, every other man's weaknesses are charged up to you, all his enemies are yours. Good clinics expect a man to prove himself before they will take him. They hire the new man on a salary to be increased each year, until he is finally accepted after so many years on an equal footing, if satisfactory. That "if" is the excuse for many clinics changing some of their specialists every three to five years. On the other hand, if a man has proven himself and has a following, he can demand equal footing. Unless you join a very large clinic, you will have to do more than one-eighth to one-tenth of the work that comes to the clinic, which is all you are qualified to do when trained in one specialty alone.

The leading medical journals have published numerous articles deploring the fact that few of the younger physicians are entering country practice. Numerous other articles have come forth explaining this problem. The cause has been attributed to the high cost of medical training, the hardships of rural practice, the poor pay received by the country doctor, the fact people discredit the ability of the small town doctor and because the big city specialist tends to look down upon his hay-seed brother. These are all good reasons. One or more of them may apply to any given case. There is a more fundamental reason.

We find a very high scholarship required by all medical schools throughout the country. What do we find on entering the internship years? The recent graduate gets his hospital appointment, feels everything is merry and his success is assured. As a rule, his first year will be a rotating service, including several of the specialties. Often he finds he cannot get a service in every specialty in one year.

After spending one year on this rotating service, which takes in certain specialties, he finds he is very limited in what he has actually learned to do in the practice of medicine. He is told that he should take more training. In order to do this he must select some specialty, in which he will serve a second year. Say he selects surgery; he becomes acquainted with a wide variety of cases covered by that specialty alone. He sees a lot of operations. Because of men higher up in that specialty, he actually learns to do very little himself.

He has spent two to four years in college, four years in medical school, two years in internship. He is married. He is in debt. He feels he should get out and practice. He is tired of being broke. He considers going out in general practice in a small town. He has missed some of the specialties entirely. He has learned to do but few of the things demanded of a general practitioner in a country community. If he goes into general practice, what things are there he has actually learned to do himself? Can he do enough to make a living? The fear that he can not decides him to stay on in surgery three or four more years and then go out as a specialist.

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* Read before the Surgical Seminar of the State University of Iowa Hospital, Iowa City, Iowa, Dec. 4, 1930.

What is the solution of the problem? I believe it is this. Give these men two years of rotating internships, including all the specialties. Prepare them so that at the end of two years they can go into general practice with confidence that they can take care of all the ordinary cases in general practice. They should know obstetrics well. They should know how to remove tonsils and adenoids well. They should know how to reduce and care for all the more common fractures, give anesthetics by the simple methods and with the simple substances, and do their own roentgen-ray and physical therapy work if they desire. They should be able to do all the common surgical and gnyecologic operations, as appendectomies, herniorrhaphies, perineorrhaphies, dilatation and curretage, repair of cervix and operation for cystocele. They should know how to lance ear drums, remove ordinary foreign bodies from the cornea, treat all the more common infections and infectious diseases, systemic and local. They should be well qualified to treat all the ordinary diseases of children and all the contagious diseases. They should have a thorough knowledge of social diseases and their treatment. They should be able to make health examinations, aspirate chests or abdomens, lance quinzies, and do a cystostomy. More especially they should know how to handle the acute traumatic conditions and the chronic and degenerative diseases.

When our medical schools, through their affiliated hospitals and staffs, prepare men for general practice, plenty of young wide awake up-to-date men will step out into the small towns. These men will be looked up to. Medical expense will be lowered and there will be fewer and better specialists.

Now let us consider some of the reasons why the specialist's training should include several years of general practice. It is the only way a physician can really decide what he likes best and what he is best fitted for. Why does the graduate usually select a certain specialty? Because some man in that specialty appeals to him most, because he likes the head of a certain department, because his friends urge him to do so and so, because he thinks such and such a specialty has the most money in it, is looked up to by the public most, is the easiest, or because some friend wants him to take up a certain specialty in order to fit into a partnership or clinic. There should be a more fundamental reason to decide a man to throw his entire life into a specialty.

Unless a man loves a specialty so much he can work at it at meal time and forget it is time to eat, and work at it nights and forget it is time to sleep, he does not love it enough to select it. In other words, unless the love of the thing permeates a physician until he gets a real joy out of doing it, he should not do it. When we do things because we have to do them, we never do them as well as when we do them because we enjoy doing them.

E. R. Stitt, Rear Admiral Medical Corps, U.S.N., in his "Plea for Basic Medical Experience Prior to Specialization," said, "A few years of well balanced general practice not only gives an appreciation of the symptoms which arise from various regional disturbances, but it affords the young physician an opportunity to determine the branch of medicine which appeals to him most and in which his colleagues, as well as himself, recognize his talent."

D. W. Cathell, in his masterpiece on the art of medical practice called, "Book on the Physician Himself," said, "To shift sails to a specialty with its greater and surer rewards should never be undertaken without first studying the great underlying principles that guide the whole profession and attaining some experience as a general practitioner."

General practice teaches the doctor to look for the common instead of the exceptional condition. Country people will forgive one for not diagnosing rare conditions, but never for passing up a common one. In general practice one sees the common ordinary garden variety of diseases and he becomes thoroughly acquainted with them, many of which he will seldom see in a hospital.

General practice gives a doctor a chance to study the beginnings of disease. Sir James Mackenzie Institute in St. Andrews exists to carry on this work. We have such a rut of studying diseases from the dead room backwards that we forget the magnificent field offered of studying these diseases from the beginning forward. Who knows what great advances in diagnosis and treatment await such a thoroughly carried out study.

General practice develops confidence after the young doctor has treated cases with his own hand according to the unmutillated dictates of his own mind and conscience and succeeded again and again; he becomes confident of his ability to do things. Along with confidence comes joy and pleasure in doing things.

General practice develops initiative. There is no one to fall back on. The physician has to figure things out for himself. He has to meet situations and make good.

General practice teaches one to treat the patient as well as the disease. So often in our anxiety to be scientifically perfect in our diagnosis and treatment, we forget we are dealing with a human being. We have all seen patients who have gone through excellent clinics and received the works from A to Z and paid their bill, who received absolutely nothing to relieve them and knew nothing about what was found. At times this is indicated. As a rule, until one gets more patients than he knows what to do with, he had better try to make life a little more worth living for having seen him.

General practice develops clinical ability. The family doctor comes in contact with all types of pathologic, functional, neurologic and domestic diseases. He gets a broadening and perspective that can be gained in no other way. The man who specializes without this training cannot help but lose his sense of proportions. He is constantly looking for something that comes under his specialty. A family doctor cannot send his patient to the laboratory and have it make a diagnosis for him. He cannot call in the staff and have a consultation. He has to sit down besides that bed and dig the thing out for himself.

General practice teaches one to treat the mental as well as the physical side of disease, and to treat and govern the mental state of the family, relatives and neighbors. It teaches one to carry responsibility. No one can feel responsibility for treatment or care of any kind, unless he has a voice in that treatment or care. No man who has to have the training and intelligence of an M.D. can take orders like an office boy and carry them out like a ditch digger and enjoy it or put much into it.

General practice teaches one to evaluate the interrelation of diseases. How can this be done unless one has handled the common diseases of every specialty and diagnosed and treated them by his own hand and according to his own mind? It is often said, and it is too often true, that if I go to a surgeon he is sure to want to operate on me. If I go to an eye specialist, he will find something wrong with my eyes. If I go to a neurologist, he will find something wrong with my nerves. If I go to an ear, nose and throat man, he will want to remove my tonsils, straighten my septum or clean out my sinuses.

The general practitioner makes the best specialist as a rule, because he makes the best consultant for the family doctor. He understands general practitioners and their problems best, and the conditions and difficulties under which they must work.

General practice teaches one the art of practice. Science of medicine means knowledge of medicine. Art of medicine means skill in the practice of medicine. What does it profit a man, if he knows surgery from A to Z, unless he is able to use that knowledge? He is as worthless to his patients as the football man, who knows all about football but never played a game, is to his school. We need the knowledge, of course, but knowledge without work is dead. Medical science without medical art is dead.

The question, should the specialist's training include several years of general practice, was asked of each of the following and their opinions requested. It would take too long to read all of each letter, so I will quote enough to give the main opinion of each.

George Blumer said, "I am decidedly of the opinion that every specialist should have a period of general training. I am not so sure that we should insist that this should always take the form of a number of years in general practice. It might very well take the form of an internship in general medicine and surgery, preceding special training."

A. H. Curtis said, "One who claims to specialize should have a very broad training, particularly in pathology and internal medicine. This can be secured in concentrated form by work in large hospitals and by special study as a resident.

E. A. Graham said, "I do not think that a young man who contemplates going into surgery as a career would benefit himself very much by several years of general practice. I think, however, that he might be benefited by spending perhaps a year as a medical intern before taking up his surgical internship."

G. W. Crile said, "I think for the specialist some graduate medical training preferably in the hospital is very much to be desired."

Emmet Rixford said, "I think there is no question that a surgeon will have a broader judgment for having some considerable experience in internal medicine. Of course, this may be secured in a hospital in rotating service."

J. E. Else said, "It is my personal opinion that general practice previous to entering a specialty gives one a broad foundation that cannot be had by those entering the specialty without such experience. For the majority that experience cannot be obtained except through years of general practice. It is possible, however, for one to attain it in a hospital by spending considerable time in the other departments previous to entering the one that he is to specialize in afterwards."

C. H. Mayo said, "My brother and I have always examined our own cases and in the early days we did everything relating to medicine just as general practitioners. In surgical cases the responsibility of the results always falls upon the surgeon, and the more general his training has been, the better he is able by his own knowledge to look after the patient before operation in the diagnosis and preparation for operation, and later in the postoperative care which is largely medical."

W. S. Bickham said, "I would distinctly say that I do not consider any man well fitted to practice any specialty until after he has practiced general medicine and surgery."

R. C. Coffey said, "I will state that the principal reason is that he learns to think for himself and meet emergencies. I think he is undoubtedly made a better specialist by several years of general practice. However, there is such a thing as his being a general practitioner too long."

A. O. Whipple said, "I would say that four or five years of general practice would be of the very greatest help to a specialist in giving him a breadth of view and experience in the general field of medicine, and a sense of proportion which he would get in no other way.

"The specialist, as we see him in many of our small cities as well as in our large cities, either self-styled or on the basis of a junketing expedition abroad, lacks this very sense of proportion and knowledge of diseases occurring in other fields, which proves such a handicap to him, and brings discredit to the term specialist, giving rise to such definitions as 'one who knows more and more about less and less.'

"A man, after training in general medicine and experience in the practice of medicine, is, with his training in his specialty, far better equipped than the man who has not had this experience."

F. J. Rohner said, "I feel it broadens a doctor's viewpoint and makes him a better specialist to have had some experience in general practice. There are some things one picks up in general practice which are very difficult to obtain elsewhere. The sick people one sees as a student and intern are looked upon as cases.

"In general practice the sick are looked upon as patients and not a machine with a defect. In general practice, lacking as one does, all sorts of mechanical devices and laboratory aids to diagnosis, he has to depend greatly on his grey matter and the use of his special senses. This naturally makes him a keen observer, and develops good judgment, besides encouraging ingenuity, qualities which a specialist can use."

You can tell by these letters which ones have done general practice. They all agree a fundamental general training should be obtained before specializing, and that we have too many specialists today who are not properly trained. To obtain this general training in the extremely specialized departmental hospital would require a regime something like this: one year rotating, one year pediatrics, one year orthopedics, one year genitourinary, one year gynecology and obstetrics, one year neurology, one year dermatology, one year medicine, one year eye, one year ear, nose and throat, and one five years surgery or fifteen years of internship training. This sounds ridiculous to you as it does to me. Yet, under the present regime of extreme specialization, how else can one get training in all lines within hospital walls?

In five years of general practice one can get a good general training in the fundamentals of all specialties, reap the twelve benefits just outlined, save up some money to specialize on and then come back and, if given a square deal, reach his master's degree in whatever specialty he chooses by spending three more years under masters in that specialty. When this general practice is preceded by two years of rotating internship which fits him for general practice, he will get an even better general training out in general practice. Then, after three more years, he will make a far better specialist than the average one of today.

Oschner said, "Ninety per cent of ailments of mankind are best treated by the general practitioner. We need ninety per cent general practitioners and ten per cent specialists." Today, forty per cent of our young doctors enter some specialty. We find that at least seventy-five per cent of the internship training is directed towards training forty per cent of the doctors to do fifteen per cent of the work. Is this fulfilling our responsibility to the sixty per cent of doctors who will go out and do at least eighty per cent of the medical work in the future?

In conclusion, we must admit that the question, should the specialist's training include several years of general practice, is a vital one to the medical profession and to the general public. We must recognize that it is a question with two sides to it. In studying the reasons against the specialist first spending several years in general practice we find the only one that will hold water is, where can one receive hospital training for general practice?

It is a cinch, if we want more general practitioners, we must train more. By giving a two year rotating internship as outlined, this weakness would be solved. By the same blow we would kill two birds with one stone, making it quite certain that most specialists would take several years of general practice, reap the rewards as outlined and recognized as obtainable by such a course, both by our study of medical literature, the medical men of the past and our consultation with the medical leaders of today. The men who had enough love for a specialty to come back to specialize, would serve as third, fourth and fifth year men in the hospitals. They would not rob the rotating men of the work they should have to do with their own hands, because they would be filled up on that type of work. They could help to teach the younger men and in turn receive the direct supervision of the masters in their specialty to whom they had come, that they might sit at their feet and learn from them.

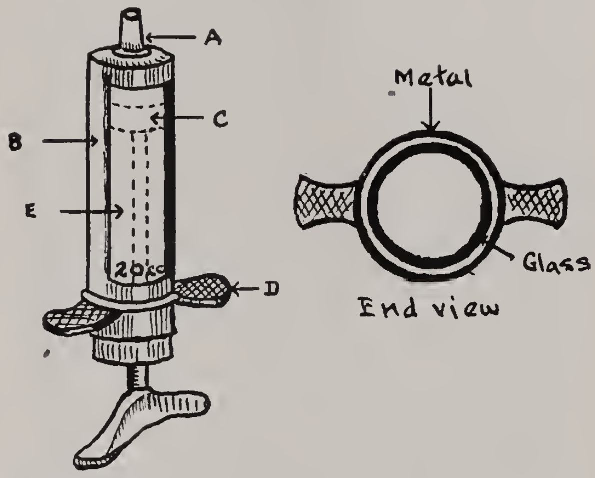
A NEW TYPE OF SYRINGE FOR BLOOD TRANSFUSIONS

Henry V. Bories, M.D.
SEATTLE, WASH.

Everyone doing the direct method of blood transfusions is frequently confronted with the problem of the syringes sticking and also cracking, the latter occurring at the junction of glass and metal. The first obstacle is greatly overcome by the use of metal plungers, such as we find in the type of record syringe. However, the second obstacle is present, that is, the danger of cracking at the glass metal site.

An extra heavy type, 20 cc. spinal anesthesia syringe, whose eccentric tip has been changed to a concentric, and whose glass barrel is not attached at the upper extremity of the syringe, I have found most satisfactory. This syringe has metal sides so as to protect the barrel and a luer tip with a large lumen to permit an easy flow of blood, thereby lessening the chance of rapid coagulation.

The principle involved in doing a blood transfusion by the syringe method depends upon the rapid transfer of blood from the donor to recipient, before the blood has time to clot. It is important to remember that the rougher the surfaces and the more extensive the area of contact the greater will be the tendency to blood coagulation.



A, Luer tip with large lumen. B, Metal casing for protection. C, Metal plunger. D, Finger grip. E, Glass free from metal at proximal end.

A syringe to be satisfactory must have the following three important features: (1) Minimal surface contact area, (2) continuous smooth surfaces, (3) ease of manipulation. For these reasons the syringes are all of the 20 cc. variety. When larger syringes are used trouble with coagulation is bound to ensue.

The luer tip fits any luer needle. I am using Lindeman's set of three cannulae, the outermost being a No. 14 gauge. This cannulae is used in both the donor's vein and the recipient's. Having a sharp point, the possibility of perforating the veins is reduced to a minimum.

I have used this type of syringe for several months without breaking one. However, if the barrel should become damaged, a new one can be replaced at a nominal cost without discarding the entire syringe.

411 Stimson Building.

ACUTE INTUSSUSCEPTION

WITH MECKEL'S DIVERTICULUM

L. S. Trask, M.D., F.A.C.S.
AND
S. E. C. Turvey, B.A., M.D.
EVERETT, WASH.

A baby boy, age fifteen months, the son of American parents, vomited one morning after a heavy breakfast. He did not complain of any pain. During the next three days he vomited everything five to fifteen minutes after eating. The vomiting was so forceful that it might be considered projectile and the vomitus consisted of undigested food. He had no pain or fever. He was drowsy, listless and irritable. His cry was spasmodic, sharp and short. He was very constipated and enemata returned scantily colored. Pulse 140. Respiration 30.

Past, personal and family histories were irrelevant.

Physical examination: He was a well-nourished boy in no pain; his facies was mildly flushed, drowsy and listless. He was not dehydrated and the tissue turgor was normal. The anterior fontanelle had ossified. Scalp normal. Eyes, pupils equal and round. Reacted to light. No ptosis, nystagmus or strabismus. Fundi negative every day of the illness. Ears. Drums not reddened or bulging. No tenderness over the mastoid area. Nose, negative. Mouth. Tongue clean and moist. Throat negative. Neck. No rigidity. Thyroid normal. No enlargement of the lymph glands. Spine, flexible. No Draper's spine sign. Heart, normal. Lungs, normal. Abdomen greatly distended and tympanitic. No tenderness, mass or rigidity. Liver or spleen not palpable. Rectum empty, otherwise negative.

Reflexes. Tache cerebrale negative, abdominals active, cremasteric active, knee jerks equal and active, no Babinski reaction present, no ankle clonus, no Kernig's sign.

Laboratory findings. Urine negative except for large amounts of acetone and diacetic acid. Blood picture. Red blood cells 3,740,000, hemoglobin 75 per cent, leucocytes 7400, differential, 42 per cent polymorphonuclears, 52 per cent lymphocytes. Cerebrospinal fluid under moderately increased pressure. Clear, colorless. Two cells per c.mm. No tubercle bacilli or pellicle formation. Gastric lavage clear, undigested food.

On the fourth day an attempt was made to feed him by a glucose series. This stopped the vomiting for eight hours, but when it started again it soon became fecal in character. An elongated sausage-shaped tumor could now be felt in the region of the cecum. Intussusception was diagnosed and a laparotomy was performed.

Under ether anesthesia a right rectus incision was made into the abdominal cavity. The lesser bowel was greatly distended and numerous coils immediately protruded through the incision. The ileum was invaginated into the cecum through the ileocecal orifice for about six inches. It was reduced and then it was found that a Meckel's diverticulum had invaginated into the small bowel. Thus a double intussusception was really produced. The advancing head of the invaginating ileum was sloughed through. An ileostomy was performed.

This was a case of a dual intussusception in a child without pain or bloody stools. The vomiting, constipation and distended abdomen were the diagnostic features at first; only late in the disease was a tumor palpable.

VACCINIA OF THE FACE

CONTRACTED FROM ANOTHER PERSON

REPORT OF A CASE

Leslie L. Nunn, M.D.
VANCOUVER, WASH.

Although it is easily possible to transfer virus from an active lesion of vaccinia to another part of the body or even to another person, the incidence, especially in the latter case, is relatively rare and I feel that the following case report merits consideration.

The patient, O. B., a male twenty-two years of age, consulted me November 24 because of an eruption of the face which had been present for six days. It first appeared as four small papules, two on the right cheek and two beneath the angle of the left mandible. These soon developed into vesicles which during the previous twenty-four hours had become covered with a light amber crust. Upon examination I found four tender, swollen inflammatory areas as above, each surmounted by a soft round crust somewhat resembling the lesions of impetigo, which incidentally was quite prevalent at that time. The patient's temperature was 99.6° F. There was marked enlargement of the cervical lymphatics on both sides. Examination of the blood showed 18,000 leucocytes; the Wassermann reaction was negative.

I made a tentative diagnosis of impetigo contagiosa and advised the patient to return the next day for further observation. On the following day he was unable to return to the office and I saw him at his home. His temperature was 101° F. and the cervical adenitis was much more marked. One lesion beneath the left jaw had by now taken on the appearance of a typical vaccinia and questioning brought out the fact that, although the patient had never been vaccinated, his younger brother had been successfully vaccinated two weeks previously and he and the patient had been sleeping together during the past month. The patient always shaves in the evening, consequently I inferred that through small fresh abrasions of the face he had been inoculated by material from his brother's arm during the night or had transferred it to his face from a towel. His recovery was without incident and he now bears four small, round scars on his face as the result of a cesssful vaccination.

Since seeing this case, Dr. Ralph Lieser of this city reports to me that recently he treated a case of vaccinia of the face in a young girl who had transferred the virus to her face from her own arm. The lesion involved the right ala of the nose, part of the right cheek and the right lower eyelid. He reports that there will probably be considerable scarring.

COMMENT

Herein is reported a case of facial vaccinia with multiple lesions, transferred from the arm of another person through accident. This, I believe, is a rather uncommon complication of vaccination, especially so because of the multiplicity of lesions. It was at first mistaken for impetigo because of the atypical appearance of the lesions.

521 Arts Building.

NORTHWEST MEDICINE

The Journal of the State Medical Associations of Oregon, Washington and Idaho

Devoted to the Interests of the Medical Profession of the Pacific Northwest

Editorial Office, 543 Stimson Building, Seattle, Wash.

APRIL, 1931

EDITORIAL

MEDICAL BILLS BEFORE THE LEGISLATURE

At every meeting of a state legislature various bills are presented bearing on many phases of medical practice. Fortunately most of these are killed for one reason or another but a few survive the ordeal and are enacted into laws. It is always of interest to review these proposed acts to ascertain the efforts of various interests to modify or interfere with established medical practice. Very few bills ran the gauntlet at the recent Washington legislative session. A Senate bill providing for nonsalaried boards of trustees for the operation of county and city hospitals was passed by both branches and was signed by the Governor. Originally specifying hospitals of three hundred or more beds, the bill was amended to include all hospitals of two hundred beds or over. The design was to remove from politics the management of these hospitals. A House bill was enacted into law permitting the purchase of alcohol by physicians and dentists for scientific and professional use under limitations of the Volstead act. A House bill was enacted providing for the registration as pharmacist of any person who, prior to the taking effect of this law, shall have had at least twelve years service in a medical department of the United States Navy and attained the rating of chief pharmacist mate or pharmacist's mate first-class. A House bill became a law regulating the sale of burial certificates and another providing that material used in the making or renovating of mattresses shall be clean and sanitary.

A long list of bills either died in committee or were vetoed by the Governor after passing both branches of the legislature, some of which were extremely vicious while others possessed merit which seemed to warrant their enactment. A House bill which was indefinitely postponed would have permitted "all licensed practitioners" to operate under the workman's compensation act. This would have militated against skilled scientific treatment of the injured with disastrous results inevitable. Another House bill, which was indefinitely postponed, would have repealed the basic science bill, permitting sanipractors to practice gynecology and surgery by redefining sanipractic, open the doors of Washington to naturopaths of other states without examination and declare naturopathy synonymous with sanipractic. Another bill indefinitely postponed amended the chiropody law to permit chiropodists to treat all ailments of the human foot, thus creating another healing cult. A Senate bill died in committee, providing that a person fitting, recommending or selling corrective shoes, arch supports or similar mechanical appliances shall not be deemed to be practicing chiropody. A Senate bill which passed the legislature and was vetoed by the Governor established a state board to pass upon the degree of alcoholization of medicinal preparations. Another Senate bill which died in committee made it unlawful to deliver to the same person in any twenty-four hour period more than four ounces of sweet spirits of nitre. A Senate bill, which passed both senate and house by large majorities and was vetoed by the Governor, prescribed conditions under which narcotics might be lawfully used and penalties for their unlawful use, making common nuisances of places resorted to by drug addicts and subject to abatement, and repealing the Beeler narcotic law of 1923. A Senate bill passed both branches of the legislature, sponsored by the White Cross, for hospitalization of narcotic addicts. This was vetoed by the Governor. Another House bill passing the senate unanimously and by a large majority in the house, was vetoed by the Governor, which limited to two years instead of three as at present the length of time during which malpractice suits might be instituted.

This review throws light on the manifold medical subjects presented for passage by legislators. Considered as a whole, one might well be thankful that so few were able to survive pitfalls incident to enactment.

DECREASE OF BOVINE TUBERCULOSIS

The role played by the bovine tubercle bacillus in the production of tuberculosis, especially in children, has long been generally recognized. Consequently the destruction of tuberculous cattle has been carried on to greater or less extent in our states for many years. A recent announcement by the U. S. Department of Agriculture presents some interesting data concerning the efforts which are being made to obliterate this disease. It is stated that during January 1,173,467 cattle were tested, exceeding by 220,958 the number tested in January of last year. This reflects an increasing interest in bovine tuberculosis eradication on the part of livestock owners and cooperating officials. In Wisconsin, Iowa, Illinois and Pennsylvania over 100,000 cattle were tested during this month. Counties free from bovine tuberculosis are designated as "modified accredited counties." During January this number was increased by 27, making a total of 1123, which is more than one-third of the counties of the country. These facts comprise one item of encouragement in the nation-wide warfare that is being waged against tuberculosis.

PACIFIC NORTHWEST MEDICAL ASSOCIATION MEETING

The annual meeting of the Pacific Northwest Medical Association, which will be held in Seattle June 25-27, will be the first effort on the part of its physicians to establish a postgraduate center for the Northwest in that city. The beautiful new Harborview Hospital of five hundred beds, with its many operating rooms and its vast material for dry clinics, will be utilized for the first time in postgraduate work. The Children's Orthopedic hospital, the Virginia Mason, Seattle General, Providence, Columbus and Swedish hospitals have always put on excellent clinics for visiting physicians.

An entire week will be given to the meeting, the first three days being devoted entirely to clinics by the local profession. On the last three days the visiting lecturers will hold forth. The programs will begin at 8:30 in the morning and end at 6:00. A smoker will be held on Thursday evening so that everyone can become better acquainted, and the banquet will occur Friday evening. Dr. H. G. Willard of Tacoma will preside at the meetings. The headquarters will be at the Olympic Hotel. Special rates at the apartment hotels nearby will be arranged for. The new Washington Athletic Club within a few blocks of the Olympic Hotel offers an added attraction this year to Seattle's facilities for hospitality.

A local committee of fifty is being chosen to handle the clinics and arrangements for the meeting. Twelve of America's outstanding medical men have signified their intention of delivering lectures and the list may be increased to fifteen before the program is completed. Practically every phase of medicine, surgery and the specialties will be covered, not by one but by several lecturers. This will undoubtedly be the outstanding postgraduate course in the West this year. Anyone desirous of having reservations made should notify the Secretary, Dr. Frederick Epplen, 639 Stimson Building, Seattle, as soon as possible. Reservations at any of the leading hotels and several of the nearby apartment hotels can be had at this time.

MEETING OF AMERICAN COLLEGE OF SURGEONS

A combined sectional meeting of American College of Surgeons, including California, Nevada, Arizona, Idaho, Utah, Washington, Oregon and British Columbia will be held in Oakland, Calif., April 23-26. The Oakland hotel will be headquarters for the meeting. There will be operative clinics in Oakland hospitals in general surgery, eye, ear, nose and throat work and other surgical specialties. The program will include clinical addresses, scientific meetings, medical motion pictures and hospital conferences. A community health meeting will be held on the evening of April 24 in Oakland and on the afternoon of April 26 in the Greek Theatre in the University of California at Berkeley.

There will be a dinner on the evening of April 23, at which several motion picture films on subjects of special interest will be shown. The programs of the scientific meetings will be provided by Fellows of the College from the participating states and province and a group of visiting surgeons. The clinical addresses will be presented by the visiting surgeons. It is anticipated that this will be the largest sectional meeting that has been held.

WASHINGTON TUBERCULOSIS ASSOCIATION

Announcement of the annual meeting of Washington Tuberculosis Association to be held in Wenatchee June 11-13 has been made from the headquarters of the Association in Seattle. Peculiar interest is attached to the meeting this year as it celebrates the twenty-fifth anniversary of the organization which was formed in 1906, and those in charge of the program plan to show the progress made in the fight against tuberculosis during this period.

An effort is being made to have present as many as possible of those who took part in forming the organization and who served on the first board of directors. Less than half of this number are now living, some of whom are still actively engaged in the procedures of the Association. Everyone who is interested in tuberculosis work is earnestly invited to attend the meeting and take part in its deliberations.

PACIFIC COAST SURGICAL ASSOCIATION

The Pacific Coast Surgical Association held its sixth annual meeting in Seattle and Victoria February 23-27, Dr. J. Tate Mason of Seattle, president, presiding. The clinics were held this year by the Seattle surgeons at Virginia Mason, Orthopedic and Providence hospitals. A preview of the new Harborview hospital was part of the program. Dr. and Mrs. J. Tate Mason entertained at dinner at their home on Tuesday evening, while the local members gave a banquet in honor of the visiting surgeons and their wives at the Rainier Club on Wednesday evening.

It is the custom of the Society to have the local surgeons entertain the visiting members at clinics the first two days and then to adjourn to some resort, where the entire membership can be free to attend the scientific program. The Empress Hotel at Victoria, B. C., was chosen by the local men as a quiet retreat. The scientific program began on the boat trip Thursday evening and continued Friday and Saturday mornings. Dr. H. G. Wetherill of Monterey, California, conducted the round-table and the surgical problems presented at the previous clinics were thoroughly discussed. About ninety attended the scientific meeting.

Two unusual features characterized the annual banquet. Dr. J. Tate Mason, presiding, presented a colorful description of the life of Dr. D. S. Maynard, the first physician in Seattle. He described in detail his early boyhood and then went through his entire life, illustrating each of his advancements by colored slides. Then Premier F. F. Tolmie of British Columbia presented the Society with a gavel made of wood taken from a tree planted by his father, Dr. W. F. Tolmie, the first surgeon in the Northwest. In the golf tournament on Friday afternoon, Dr. S. Everingham of Oakland won the Lamson trophy.

The next meeting will be held in Los Angeles. The following are the officers selected for the ensuing year: President, Rea Smith, Los Angeles, Calif.; First Vice-president, Charles M. Fox, San Francisco, Calif.; Second Vice-president, Raymond E. Watkins, Portland, Ore.; Secretary-treasurer, Edgar L. Gilcrest, San Francisco, Calif.; Member of the Council, Rexwald Brown, Santa Barbara, Calif. Other members of the Council are J. Tate Mason, George W. Swift, Seattle, Wash.; A. A. Matthews, Spokane, Wash.; Philip K. Gilman, San Francisco, Calif.

NEW JOURNAL OF NEUROLOGY

The first issue has been received of the *Bulletin of the Neurological Institute of New York.* By reason of certain research funds, initiation of several new research programs has been rendered possible, the results of which warrant the creation of a special journal which will appear three or four times during the year. The Committee on Research believes that future stability of neurology will rest on the results of controlled laboratory experiment and study. Preference will be given in this Bulletin to the publication of investigations resulting from morphologic, physiologic or pathologic studies. This first issue presents papers dealing with meningeal fibroblastomas, brain lipoids as an index of brain development, obstruction of aqueduct of Sylvius, tumors of the posterior cranial fossa. These subjects suggest the character of studies which will be presented in this publication.

BASIC SCIENCE LAW SUSTAINED

The Washington Basic Science Law has already been upheld by the state courts. Now the same support has been given by a United States court. Last month a dietitian and a plumber brought suit before the Federal Court to restrain officials from enforcing the law as it affects applicants for licenses as physicians, surgeons, osteopaths, chiropractors and drugless healers. Circuit Federal Judges Neterer, Rudkin and Cushman concurred that "those who desire to treat the sick must show familiarity with the structure of the human body and the functions of the organs and parts." The suit was dismissed.

A COOPERATIVE CLINIC TOUR OF EUROPE

A tour to Europe is being planned for physicians and their families, leaving Montreal June 12. This tour is under the auspices of the Travel Guild, Inc. of Chicago. It will be under the direct supervision of a physician familiar with European cities, desirable clinics and other features of interest to medical tourists. The price for this trip will be $895.00. Elsewhere will be found an insert giving details of this summer tour. Anyone wishing further information can obtain more details by clipping the coupon for the address which will be found upon it.

ERRATUM

In the March issue was published a paper, "Benign Infiltrations in the Childhood Type of Epituberculosis," by Dr. Samuel G. Henricke of Portland. This title was incorrectly worded. It should have read, "Benign Infiltrations in the Childhood Type of Tuberculosis (Epituberculosis)."

MEDICAL NOTES

OREGON

University of Oregon Medical School Alumni Association held its annual meeting in Portland, March 11-12. It was largely attended by graduates, including many of the best known physicians and surgeons of Oregon. Most of the addresses were scheduled at the Auditorium of the Medical-Dental Building with clinics in the hospitals and medical school. Physicians of the city conducted clinics at the Doernbecher Memorial Hospital, Multnomah County Hospital and in the new clinic building of the Medical School. Lectures were presented on diseases of children, internal medicine, various phases of surgery, physical therapy and roentgen-ray technic. The annual banquet was held at the Portland Hotel on the evening of the twelfth. A general meeting of the guests and Portland Academy of Medicine was held on the afternoon of the first day, at which an address was delivered on surgery by Dr. Evarts A. Graham, professor of surgery at Washington University, St. Louis. Officers elected for the coming year were: President, Dr. Ivan M. Woolley, Portland; first vice-president, Dr. C. A. Lewis, Portland; second vice-president, Dr. C. D. Donahue; third vice-president, Dr. J. B. Bilderback, Portland; fourth vice-president, Dr. J. C. Brougher, Vancouver, Wash.; secretary, Dr. W. H. Belknap, Portland; treasurer, Dr. John Stromfjord.

Memorial Niche in Medical School. In the lobby of University of Oregon Medical School, a memorial niche was unveiled last month in memory of the nursing personnel of Base Hospital No. 36 serving in the World War, with special reference to three members who died in service in France. The unit was organized on request of the late Dr. K. A. J. MacKenzie, Dean of the medical school. The hospital of this Oregon Medical School unit had 2000 beds. It received patients chiefly from the Verdun sector.

Additions to Tuberculosis Hospitals. The state board of control has ordered the preparation of plans for an addition to the state tuberculosis hospital at Salem to cost $100,000. A new building will provide 70 additional beds, together with a physician's cottage. Also plans have been made for an addition to the state tuberculosis hospital at The Dalles to cost $40,000, which will provide for 40 additional patients. An extension to the dining room is also contemplated to cost $9,000. The school for the feeble minded at Salem is to be enlarged at a cost of $50,000.

Oregon Tuberculosis Association at its annual meeting, held in Portland March 10-11, elected Dr. R. C. Matson chairman on the committee for tuberculosis. Others on the committee are Drs. Frederick Stricker, G. C. Bellinger, N. E. Irvine and Thomas Griffith. A program will be developed to help reduce the high death rate among young people. By distribution of free literature on tuberculosis an "early diagnosis campaign will be inaugurated."

Hospital Enlarged. Announcement has been made of additions to be built to Emanuel Hospital, Portland. A maternity ward will be constructed at one end of the hospital, with provision for seventy beds. Another unit at the other end will contain twenty additional beds. These additions will cost about $200,000.

Enlargement of State Hospital. Preparations are being made for constructing a three-story wing for the eastern Oregon state hospital at Pendleton at a cost of $205,000. It will be fifty-three by one hundred sixty-five feet, of reinforced concrete. There will be accommodations for 210 patients.

New Veteran's' Hospital Located. The site of the location of the new Veterans' Hospital has simmered down to some point in Oregon south of Portland and west of the Cascade mountains. It has been announced that Roseburg is the selected site.

Surgical Journal Recognized. *The Western Journal of Surgery*, published in Portland, was designated as the official organ of the Pacific Coast Surgical Society at its recent meeting at Victoria, B. C. Members of the local editorial board are Drs. R. C. Coffey, R. B. Dillehunt, J. E. Else, R. A. Fenton, W. B. Holden and G. C. Schauffler.

New Medical Clinic. Dr. William A. Harroun of Portland has submitted plans for the location and construction of a diagnostic clinic in Astoria. The buildings would cost approximately $75,000 with equipment valued at $20,000.

New Private Hospital Built. Dr. Lee B. Bouvy of La Grande has completed and opened an eye, ear, nose and throat clinic and hospital, occupying the entire floor of the Foley Building.

Reserve Corps Appointments. Four house physicians at St. Vincent's hospital have received their appointments as first lieutenant in the medical corps of the United States army. They are Drs. Russell Sweeney, John Marxer, Sidney Rubenfeld and Hugh Brown.

Dr. S. M. Kerron, county and city health officer and head of the Lane county health unit, left Eugene last month for a special course in public health methods in the East. He has been appointed to this study by the United States Public Health Service.

Klamath and Lake County Society meeting was addressed by Dr. Ralph Fenton of Portland on the subject of squint, at a meeting held March 17.

Dr. I. U. Temple of Pendleton has been appointed city health officer for the ensuing year.

Books for Nurses. Oregon State Medical Society has recently donated the sum of $340 to the Portland Library Association for the purchase of books of interest to nurses.

WASHINGTON

Appointed Hospital Superintendent. Dr. Walter C. Lippincott of Seattle has been appointed superintendent of Seattle General Hospital. This is the first time in the history of the institution that this position has been held by a physician. By reason of his long residence in the city and the high esteem in which he is held by the profession, Dr. Lippincott's incumbency will promote the welfare of the hospital.

Appointment of Hospital Trustees. A law passed by the recent legislative session and signed by the Governor, requires that county and city hospitals of two hundred or more beds shall be administered by boards of trustees, appointed by county commissioners. Originally framed for hospitals of three hundred or more beds, it would have applied only to Harborview hospital in Seattle. Its amended provision makes it include those also in Pierce and Spokane Counties. Trustees are to be appointed for six year periods. It is expected that these boards will direct hospital management free from interference by political influences.

Hospital Appointments. Dr. George H. Anderson was elected president of the staff of the Deaconess hospital at Spokane at a meeting held March 10. Dr. Paul P. Hagaman, vice-president and Dr. O. M. Rott, secretary, were likewise elected.

Postgraduate Medical Course. Preliminary announcements of this year's postgraduate lectures and clinics held at the University of Washington, Aug. 3-5, include the names of the following lecturers: Dr. William D. Haggard, professor of surgery at Vanderbilt University; Dr. John A. Stokes, internationally famous syphilographer and professor of dermatology at the University of Pennsylvania; Dr. George M. Piersol, professor of medicine at the University of Pennsylvania and Dr. Carl H. Davis, professor of obstetrics and gynecology at Marquette University.

The Hoover Child Health Program. Dr. A. E. Anderson of Aberdeen, president of Washington State Medical Association, on returning from his trip to Washington, D. C. to attend President Hoover's Conference on Child Health and Protection, reports that the plans of the conference, if carried out, will guarantee the American child the best health protection in the world.

Golden Professional Anniversary. Dr. B. F. West of the University district in Seattle has celebrated the fiftieth year of his practice in the field of medicine. The last twenty-five years have been in Seattle in the University district. His previous field of practice was in Indiana.

Army Appointment. Dr. Otto L. Churney of Bellingham has been commissioned first lieutenant in the United States Army Medical Corps and has been assigned to Fort Lawton. The life of an army surgeon is in anticipation.

Dr. L. P. Murphy of North Bend has resumed his practice in that city after an absence of six months, due to illness. He will replace Dr. G. W. Freeman, who has been doing his work. Dr. Freeman has opened an office in the Cobb Bldg., Seattle, Wash., to be associated with his brother.

Yakima County Medical Society meeting was addressed at its monthly dinner meeting March 9 by Dr. R. D. Forbes, of Seattle. The subject of his paper was Abdominal Exploration. Dr. A. B. Hepler, also of Seattle, was on the program to read a paper on Diseases of the Prostate Gland.

Clallam County Medical Society held a meeting at Port Angeles, February 18. Mrs. Elizabeth Soule of Seattle, head of the Nursing Department at the University of Washington, addressed the meeting. Her talk outlined the plan for the work to be given at the new Harborview Hospital.

Dr. Robert Saylor of Port Angeles has been appointed reservation doctor for the Makah and Quillayute Indians. He will make his headquarters at Neah Bay.

Dr. J. Wilson Reed, who formerly practiced at Valley, has located at Entiat. This town has been without a physician and Entiat Commercial Club made inducements for the doctor to settle at this location.

Jefferson County Medical Society meeting was held Thursday, February 19, with twenty doctors in attendance. Papers were read by Drs. S. T. Parker and W. J. Ash of Seattle.

Dr. A. C. McPhaden is opening offices in Concrete, following six months postgraduate work in Chicago. He formerly practiced in this city and Mount Vernon.

Dr. Terence T. Dawson has returned to Seattle after two months attendance in eastern clinics. He visited medical centers in Chicago, Baltimore, New York City, Buffalo and Rochester.

Weddings. Dr. Donald K. Corbett, recently of Seattle, was married to Miss Georgia Ann Kendall of Seattle at Baltimore, Maryland, where Dr. Corbett is studying at Johns Hopkins Hospital. Dr. Harold Lang Kennedy was married to Miss Caroline G. Cavanagh March 17 at Shelton.

IDAHO

The Latter Day Saints Hospital of Idaho Falls announces the opening of a serologic and pathologic department with Dr. Joseph Balo as director. Dr. Balo formerly occupied the chair of pathology in Franz Joseph University at Saget, Hungary.

County Physician Appointed. Dr. R. J. Sutton, Bonneville county physician, has been reappointed by the board of commissioners to serve for another term.

Sanitary Inspector. Dr. J. S. Allen of Idaho Falls was appointed sanitary inspector by the mayor February 17.

OBITUARIES

Dr. Edward C. Neville, Seattle, Wash., died suddenly March 22, aged 63 years. For several years has was afflicted with disease of the heart, following a severe attack of influenza. He was born in Gallion, Ohio, in 1866. He received his medical degree from Fort Wayne Medical College. He served as assistant surgeon at Fort Wayne General Hospital for three years before locating in Seattle in 1901. He has continued in active practice during the past thirty years, up to the time of his death.

Dr. Robert C. Elsworth died at the United States Veterans' Hospital, Portland, Ore., March 17 after an illness of three weeks, aged 65 years. He was a graduate of Jenner Medical College, Chicago, in 1893. He spent most of his professional life in the United States army, holding the rank of major. He saw considerable service in the Philippine Islands and was with Theodore Roosevelt's Rough Riders in 1898. Following the Spanish-American war he was in the service during the Boxer campaign in China. He was also on the medical and surgical staff of the United States Marine Corps during the World war.

Dr. William T. Phy, Hot Lake, Ore., died March 4 at Hot Lake Sanatorium, aged 58 years. Death was due to bulbar paralysis, from which he had been ill for several months. He was born at Dallas, Ore., in 1873. He graduated from Kansas City Medical College in 1897. For a number of years he has owned and directed Hot Lake Sanatorium and has been well known as an able surgeon. He was a member of the State Board of Health and was a leader in community activities for many years.

Dr. Charles W. Cosford died at Spokane, Wash., February 25, aged 83 years. He graduated from Cincinnati Medical College in 1879. Soon after this he also graduated from a dental college. He practiced both medicine and dentistry in Ohio for many years. For the past twenty-six years he has been in general practice in Spokane. His wife, who died some years ago, was also a physician and dentist.

Dr. George M. Sewell, aged 56, of Portland, Ore., died March 15 at the Veterans' Hospital, following two weeks illness. He was born in Rutland, Ill. He graduated from the University of Minnesota Medical School in 1909. He was on the staff of the Good Samaritan Hospital and practiced in Portland thirteen years. He served with the Medical Corps at Fort Funston during the World war with the rank of captain.

IN MEMORIAM

HORACE MAYO BOYDEN, M. D.

1907-1931

Medical House Officer

On February 2, 1931, died at the Peter Bent Brigham Hospital, Boston, Horace Mayo Boyden. An early death has ended a career of great promise; a young man of engaging personality, who already had given evidence of great capability, has gone into the great beyond.

Horace Mayo Boyden was born on April 7, 1907, at Brookings, South Dakota. In 1910 with his parents he moved to Pendleton, Oregon, where he attended school and graduated from the high school. Then he entered the University of Oregon, graduating in 1927 with the degree B.A. Subsequently he entered the Medical School of the University of Michigan, from which institution in 1930 he received his M.D. degree.

Both in college and medical school he won enviable rank for scholarship and was a favorite in a large circle of classmates. At the University of Oregon he was a member of the Kappa Sigma fraternity; at Michigan he held membership in Phi Kappa Phi and Nu Sigma Nu. His work as a medical student won for him membership in Alpha Omega Alpha, the honor medical fraternity. His study of medicine was a natural sequence to the interest in medicine created by his father, Frank E. Boyden, a well known surgeon in the Pacific Northwest, now resident of Portland.

In competitive examination Horace Boyden won a house-officership in medicine at the Peter Bent Brigham Hospital and in the middle of October began his work. Eager, intelligent, capable, well trained, his work was done in a most acceptable fashion. His associates of the resident staff and the members of the visiting staff soon acquired a high regard for him and entrusted to him various duties with the feeling that what was assigned him to do would be well done.

In the early hours of January 31, 1931, he awoke from sleep with a painful throat and a chill. A high fever persisted. At noontime the white cells in his blood were only 200 per cubic millimeter and no polymorphonuclear leucocytes could be seen. A nucleotide was given in the hope of stimulating a production of polynuclear cells but with no success. Twenty-four hours before his death his father arrived in Boston, having flown from Portland to Boston in thirty-three hours. Late in the afternoon of February 2 he died from agranulocytic angina. His body was taken to Portland for burial.

The death of a young man, just on the threshold of commencing the career long trained for is sad, and this sadness is felt by all who have come in association with him. We of the staff of the Peter Bent Brigham Hospital mourn the loss of one of our members and extend to his father, mother and brother our heart felt sympathy.

Peter Bent Brigham Hospital, Henry A. Christian,
Boston, Mass. Physician-in-chief.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

CHELAN COUNTY MEDICAL SOCIETY

Pres., R. T. Congdon; Secty., A. G. Young

Chelan County Medical Society held its monthly meeting at Wenatchee, March 4. Dr. D. A. Palmer of Spokane read a paper, "Management of Chronic Colon." Dr. W. C. Countryman of Spokane presented a paper on "Penetrating Wounds of the Heart." A case with recovery was reported. Dr. Ihrens gave a report of a heart injury which had come under his observation. Dr. C. B. Ward of Spokane gave an address on "Cancer and Its Treatment by Radium," illustrated by slides and pictures.

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the Auditorium of Medical-Dental Building, Seattle, March 2, with President R. J. McCurdy presiding. About 100 members were present. Minutes of the meeting of February 2 were read and approved.

Dr. C. E. Watts presented a patient with perforation of the aortic valve, giving a history and description of the case. Dr. R. D. Forbes reported a case of carcinoma of the rectum with exhibition of specimen.

A letter was read from Dr. C. C. Kehl, regarding a narcotic addict by name of Garrad.

Dr. William H. Walsh of Chicago gave a resume of the departments of Harborview hospital, in the construction of which he has been the expert director. The hospital offers complete and adequate facilities as a postgraduate teaching center. He described the different departments of the institution with a summary of the total cost and the cost per bed. While there is a present capacity for about 600 patients, this can later be increased to 1000 without additional service expenditure.

Dr. L. D. Fricks, medical director, United States Public Health Service, read a paper describing the activities of this branch of Government service. He reviewed its activities from the establishment of the Marine Hospital Service in 1789 to the present time. The functions of the public health service were summarized and a description given of its activities through its eight administrative divisions.

Dr. Glenn C. Grover read a paper on paralytic ileus. The different types were described, cases arising immediately after the operation being most frequently due to infection. Obstruction due to trauma accompanying operative procedures may be caused by reflex inhibition of bowel movements. Splanchnic and high spinal anesthesia offer encouraging results for treating ileus. Continuous duodenal and gastric lavage, saline infusions, morphine and Fowler's position are effective in lowering mortality. The paper was discussed by R. D. Forbes and C. E. Hagyard.

Three groups of photographs of past presidents of the society were presented by Dr. C. A. Smith as a gift from the Seattle Medical Library.

Dr. C. W. Sharples urged the members to vote at the coming city election. He urged the importance of voting for candidates who would aid in the decrease of taxes.

The medical section of the society held a meeting March 9, with Dr. D. H. Nickson in the chair.

Dr. Evarts A. Graham, professor of surgery, Washington University School of Medicine at St. Louis, read a paper "How Shall We Estimate the Operative Risk and Diminish Mortality in Patients with Disease of the Biliary Tract." Advances made by physiologists and physiologically minded surgeons have reduced the operative risk in biliary tract cases. Death may be due to pulmonary, cardiac or unexplained causes. Failure of hepatic function is an important factor, as damage to the liver must be considered in all cases of cholecystitis. Estimation of excretory power of the liver is a valuable guide. The mode of determining this was explained. Increase in calcium storage is an important factor, liver damage being repaired more promptly after its increase. Massive atelectasis may follow operation which is prevented by administration of CO_2 before patients leave the surgery. Mortality of males is three times that of females.

Dr. D. G. Dickerson presented two patients to whom paravertebral alcohol block had been administered with complete relief of symptoms.

PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the auditorium in the Rhodes Medical Arts Building, Tacoma, March 10, Dr. D. M. Dayton in the chair.

Dr. Robert L. Benson, of Portland, read a paper on "Asthma" which covered all of the different theories, both European and American, in regard to the etiology of asthma and hay fever, especially in regard to allergy. He showed many slides illustrating different skin and allergic reactions. This paper was discussed by Drs. Duerfelt and Davies.

The second paper of the evening was by Dr. W. Ray Jones of Seattle on "Gonorrhea Debunked." He covered this subject thoroughly, with very many practical recommendations.

WALLA WALLA VALLEY MEDICAL SOCIETY.

Pres., F. M. Campbell; Secty., G. C. Daniels

The regular meeting of Walla Walla Valley Medical Society was held at Marcus Whitman hotel, Walla Walla, March 19. A dinner was served preceding the scientific session.

Dr. George Anderson of Spokane read a paper on "Heart Disabilities." Dr. A. M. Codd of Spokane delivered an address on "Mechanical Examination of the Lungs and Stomach."

Dd. Frank Leslie, formerly professor on eye, ear, nose and throat at Chicago Polytechnic Postgraduate School, has located for practice at Albany.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Physiological Chemistry. A Text-Book and Manual for Students. By Albert P. Mathews, Ph.D. Carnegie Professor of Biochemistry, The University of Cincinnati. Fifth Edition. Illustrated. 1233 pp. $7.00. William Wood and Company, New York, 1930.

In the preface of the first edition the author expresses the hope that the book may raise in the minds of those who read it more questions than it answers. As one reads the work he feels that the hope is realized to at least a considerable extent. Many questions are answered in a satisfactory manner but it is always the evident desire of the author to point out gaps and uncertainties in our knowledge. The reader who must have positive statements can hardly derive much pleasure from this volume and the faddist will find scant support in it for his generalizations. Most physicians will probably find there is much doubt about many things they have accepted as facts.

The book is divided into three parts. Part 1 deals with "The Chemistry of Protoplasm and the Cell"; part 2, "The Mammalian Body Considered as a Machine, Its Growth, Maintenance, Energy Transformations and Waste Substances"; part 3, "Practical Work and Methods." The last mentioned is a laboratory manual. The chapters on physical chemistry, on protoplasm, those on digestion and absorption, on excretions, metabolism, blood and the circulating tissue are of particular interest to the physician. The book is well written and, since the author is so anxious to raise questions in the mind of the reader, it is very stimulating and makes one more cautious about dogmatic opinions.

Griswold.

Developmental Anatomy. A Text-book and Laboratory Manual of Embryology. By Leslie Brainerd Arey, Ph.D., Robert Laughlin Rea, Professor of Anatomy, Northwestern University Medical School, Chicago. Second Edition, Reset. 563 pages with 532 illustrations, many in color. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $6.50.

This is not the ordinary second edition but essentially a new book. The general plan is the same as in the first edition but each chapter has been replanned and rewritten. It is divided into three parts. The first concerns general development, including teratology. The second part, organogenesis, is subdivided into three sections, the entodermal, mesodermal and ectodermal derivatives. Part three is a short manual for the study of chick and pig embryos.

The emphasis is on human embryology. The book is clearly written, replete with 1,037 drawings and has several valuable lists and tables which condense much data into tabular form. While of particular value to those studying embryology for the first time, it is also a very good book for looking up specific information.

Metheny.

A Manual of the Common Contagious Diseases. By Philip Moen Stimson, A.B., M.D., Associate in Pediatrics, Cornell University Medical College; Attending Physician, Willard Parker Hospital, etc. 351 pp. Cloth $3.75. Lea & Febiger, Philadelphia, 1931.

This is a concise treatise on contagious diseases, written primarily for medical students and nurses. The author's experience in this field is a wide one, based on both hospital and private practice. The preliminary chapter is devoted to a review of the "Principles of Contagion." Then follows a chapter on "Serum Reactions" which can be read with profit by anyone who has to administer antitoxins in his practice. The various contagious disorders are described in individual chapters. Most valuable perhaps are the author's up-to-date descriptions of the use of specific therapeutic measures, e.g., passive and active immunization against scarlet fever, passive and active immunization the treatment of measles, the present status of vaccine therapy in whooping cough, etc.

The general management of contagious diseases in hospitals is discussed and, following this, a most valuable detailed description of the medical and nursing technic as employed at the Willard Parker hospital. There are also chapters on the prevention and management of communicable disease in boarding schools, day schools and in the home. This small volume is earnestly recommended to physicians who may desire to learn in a few hours reading the latest developments in the field of contagious diseases.

Olmstead.

Operative Obstetrics on the Manikin. For Students and Practitioners. By Charles B. Reed, M.D., F.A.C.S. Associate Professor of Obstetrics, Northwestern University Medical School, Chicago, etc. With two hundred and fifty-four illustrations. 314 pp. $4.00 P. Blakiston's Sons & Co., Philadelphia, 1931.

This is an excellent epitomy of obstetric operative procedures with copious illustrations and brief statements of diagnostic points and indications. The book should be of considerable use to students and internes who are learning the art of obstetrics. A chapter on forceps and another on forceps where the occiput is posterior are instructive and amplified by numerous illustrations. Breach and transverse presentation, as well as version, are considered in detail and well illustrated. Practitioners who are unfamiliar with the technic of obstetric operations will find this volume a convenient source of reference. Wright.

Physiology. By John F. Fulton, M.D. Sterling Professor of Physiology, Yale University. Illustrated. 141 pp. $1.50. Paul B. Hoeber, Inc., New York, 1931.

This small volume of the series, "Clio Medica," offers a fascinating, condensed historical sketch of physiology. It follows three main themes, circulation, respiration and digestion. Of these the most prominent is the circulation, since nearly all other branches of physiology had to await its discovery before progress could be made. Aristotle considered the heart as the source of vital heat. Air taken into the lungs reached the heart by the pulmonary vein and cooled it. He believed the arteries conveyed messages to the limbs, provoking them to motion. To the heart and blood vessels were attributed functions of the central nervous system. Galen was supreme among physiologists. He conducted numerous experimentations, learning thereby facts concerning the nervous system, kidney and other organs. The chapter on circulation of the blood is replete with interest. Canano discovered the valves of the veins about 1560, which fact was further studied and elaborated by Fabricus, but the great discovery remained for Harvey which was published in 1628. The chapters on respiration and digestion deal with many interesting discoveries. It was not until the nineteenth century that teaching laboratories were instituted. Sketches are offered of the lives of many workers in this line. Anyone interested in physiology will find this booklet well worth reading.

William Henry Welch at Eighty. A Memorial Record of Celebrations Around the World in His Honor. Edited by Victor O. Freeburg. Published for the Committee on the Celebration of the Eightieth Birthday of Doctor William Henry Welch by the Milbank Memorial Fund, New York, 1930.

The contents of this volume were assembled by an executive committee, whose chairman was Dr. Simon Flexner of the Rockefeller Institute for Medical Research and its secretary, John A. Kingsbury of the Millbank Memorial Foundation. The latter says, "This book is published as a memorial record, even though necessarily incomplete, of the celebrations in honor of the eightieth birthday of Dr. Welch. While the book is primarily a record of a particular occasion, it contains materials that illustrate the whole career of Dr. Welch and reveal many of the reasons for the profound affection of those for whom and with whom he has worked." These celebrations were held simultaneously on April 8, 1930, in many cities of this country as well as London, Paris, Peiping and Tokyo. In addition there are included letters and telegrams from leading educators and scientists from all over the world. While the reading of this volume is unnecessary to prove the affection and esteem in which Dr. Welch is held by the medical profession of the world, it is interesting to note these sentiments of appreciation as they appear on the printed page.

Microbiology and Elementary Pathology. For the Use of Nurses. By Charles G. Sinclair, B.S., M.D. Major, Medical Corps, U. S. Army, etc. With 102 illustrations, some in colors. 362 pp. $2.50. F. A. Davis Company, Philadelphia, 1931.

This book is intended to give a suitable perspective of the subjects considered without burdening the student with the extensive descriptions of the medical textbook. The section on microbiology takes up in order the recognized microorganisms with a description of each, its pathogenesis, laboratory diagnosis and some reference to its occurrence. The principles of infection, methods of sterilization and other recognized principles are presented. Practical aspects of immunity are discussed without too much detail. That part of the book dealing with elementary pathology includes sufficient data to give the student valuable information.

The Surgical Clinics of North America. (Issued serially, one number every other month.) Volume 11, No. 1. (Chicago Number—February 1931.) 225 pages with 72 illustrations. Per clinic year (February 1931 to December 1931), Paper, $12.00; Cloth, $16.00. Philadelphia and London, W. B. Saunders Company, 1931.

In this volume the veteran surgeon, Bevan, presents clinical cases illustrating the general principles involved in the operation of laparotomy. He also discusses anes-

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thesia, abdominal incisions, drainage, postoperative treatment and complications. Speed describes and discusses an interesting case of aerocele of the scrotum. He describes various routes through which air enters this portion of the anatomy. Theis reviews the principles and technic of the injection method in treating varicose veins. He offers an instrument for this treatment which combines desirable technic which should facilitate this operation. There are many other interesting surgical conditions presented in this volume.

The Medical Clinics of North America. (Issued Serially, one number every other month). Volume 14, Number 5. (Chicago Number—March 1931). Octavo of 255 pp. with 21 illustrations. Per Clinic Year, July 1930 to May 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London; W. B. Saunders Company, 1931.

This volume presents many instructive clinical reports from leading internists of Chicago. Diseases of many organs are considered, with valuable suggestions as to treatment. There are reports of various disorders of the gastrointestinal tract, phases of nephritis, different leukemic conditions, circulatory pathology and other interesting disease studies. One will find this volume worthwhile for study.

Treatment of Drug Addiction. Charts are presented by Alexander Lambert, New York (*Journal A. M. A.*, March 14, 1931), in which all observations have been translated into curves showing the intensity and duration of the various symptoms during withdrawal of morphine. One hundred patients were treated as controls. Narcotics were not given unless a patient was threatened with a serious collapse during his withdrawal period; sterile water, containing a little glycerin and colored with a few grains of bismarck brown to make it the same color as Narcosan solution was given and neither the nurses who gave the injections, nor the patients themselves, could tell whether a control solution or the medication was being given. The injections were run parallel, and this removed from the patients all sense of fear that they were not receiving some narcotic treatment and definite medicine. This enabled one to judge the reactions following the treatments as being the real withdrawal symptoms. The results of the treatment show that the gastrointestinal symptoms under Narcosan are much increased over the controls; muscular discomfort with aches and twitching comes earlier with the use of Narcosan, rises higher, and then diminishes equally with the others; the restlessness is practically the same with Narcosan as in the controls; the prostration during the entire treatment is slightly more noticeable under Narcosan than in the control.

The next drug to be tried as a treatment was atropine. It is evident from the curves that those receiving atropine show about the same symptoms as the controls but that the recovery from their symptoms is prolonged, and that they recovered more slowly from their symptoms under atropine than did the controls. The gastrointestinal reaction is less severe under atropine; the muscular discomfort is not quite as severe but lasts distinctly longer; restlessness, however, is more intense under atropine than in the controls, and prostration occurs more quickly, and, while not more prolonged, is slightly more intense. Under scopolamine patients suffer more than the controls; their suffering does not begin as soon, it rises to its climax at the end of forty-eight hours of treatment, and the gastrointestinal symptoms are markedly increased under the scopolamine. Muscular discomfort is practically the same as in the controls, and their restlessness and delirium and mental and physical activity are enormously increased under scopolamine, as well as is their prostration, which is more intense in all periods of the treatment, beginning earlier, and lasting considerably longer. These results agree with previous clnical experience, that patients being taken off morphine under the scopolamine treatment suffer for days, or weeks, from a bodily and mental exhaustion that is one of the most marked features of the treatment. A seven-day reduction of morphine was tried in which the patients, as compared with the controls, suffered materially less. But while their suffering was less intense it was more prolonged, and at the end of the seven days, when they were cut off their drug, the withdrawal symptoms flared up acutely, but with marked diminution in intensity in all patients. The patients, however, were less easy to care for; they were irritable, mean, more quarrelsome, and more difficult in every way to manage. It is interesting that after the morphine was cut off from these patients, they still had about seventy-two hours of increase of symptoms. In a fourteen-day reduction, it is noticeable that the gastrointestinal symptoms are reduced to a minimum; the muscular discomfort, however, increased, with a rising curve toward the day on which morphine ceased to be given, at the end of two weeks, and then flared up for forty-eight hours and rapidly diminished; restlessness was diminished in comparison with the controls, but in a rising curve, until it also disappeared; prostration showed a similar curve, but to a less degree.

The next method of treatment was an endeavor to ascertain to what extent codeine would control the withdrawal symptoms of morphine. Clinical experience had taught that codeine does control them and that it is so rapidly discharged from the body by the kidneys that it is not stored up as long as morphine, nor does it possess the narcotic value to the human organism that morphine does. It produces sleep, it alleviates pain to a marked degree, but that curious narcotic value it does not possess, and codeine habits are exceedingly rare. In 1,700 patients in private practice, treated for many different narcotic addictions to the various habit forming drugs of the opium group and the hypnotic chemical group, it was found that only ten of them were addicted to codeine, and these had acquired it through their endeavor to alleviate pain. In those receiving rapid reduction with codeine, the curves show that at the end of the week, when the morphine was cut off, there were the regular three days of increase of symptoms after the codeine was also cut off, but these symptoms do not rise as high as do those in the fourteen-day reduction, nor as high even as the symptoms after a seven-day reduction. Since these experiences have been carried on, it has been found by the author in private practice that, if the codeine is continued a few days beyond the morphine and is tapered off rather rapidly, that is, in four or five days, the symptoms are reduced to a minimum, although there is a sense of irritability and restlessness. Even that is of little consequence compared with the usual withdrawal symptoms. In other words, the withdrawal symptoms do not go beyond the intensity of the disagreeable restlessness produced by the cutting off of any narcotic. The gastrointestinal symptoms disappear, the muscular discomfort is at a minimum, the restlessness is the most marked of the symptoms, but that soon ceases. It is evident, therefore, that codeine is the only drug that really modifies materially and successfully the withdrawal symptoms of morphine. The best method of giving codeine treatment is described in detail.

VENTRICULIN

(Desiccated, Defatted Hog Stomach)

Specific in Pernicious Anemia

Accepted for N.N.R. by
Council on Pharmacy and
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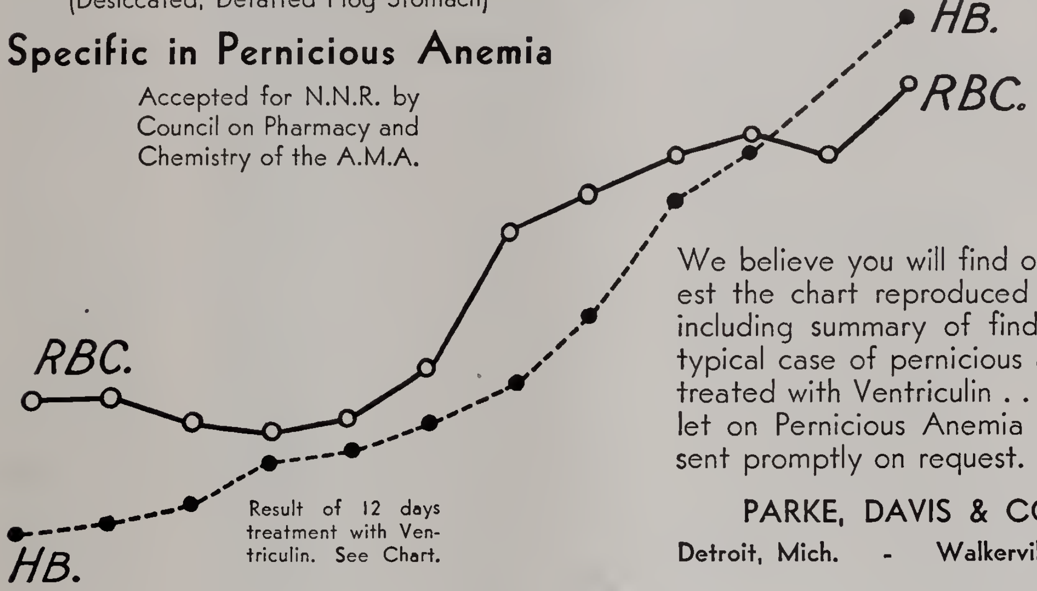

Result of 12 days treatment with Ventriculin. See Chart.

We believe you will find of interest the chart reproduced below, including summary of findings in typical case of pernicious anemia treated with Ventriculin . . . Booklet on Pernicious Anemia will be sent promptly on request.

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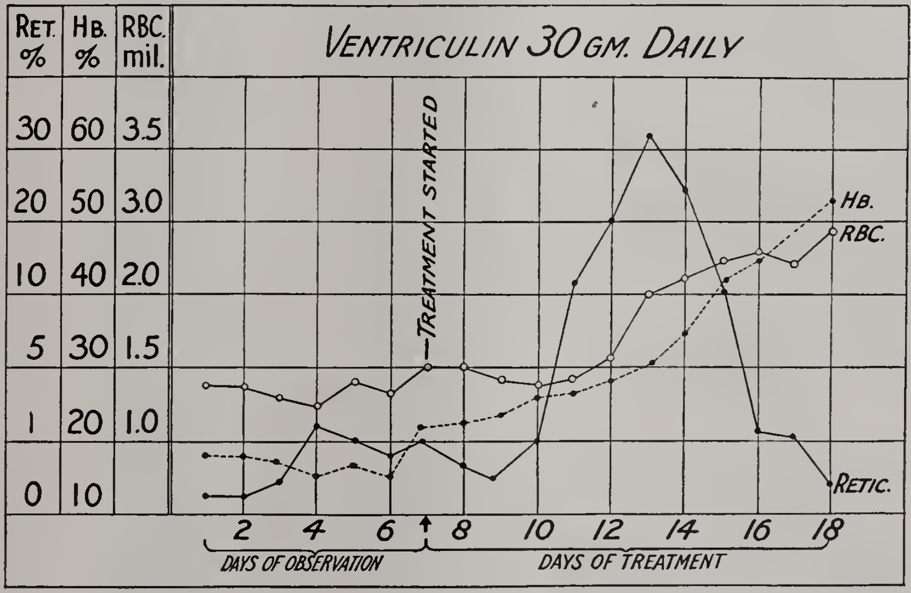

DIAGNOSIS. Pernicious anemia.

INITIAL BLOOD COUNT: Red blood cells 1.5 million per cu. mm.; Hemoglobin (Newcomer) 21 per cent; Reticulocytes 1.0 per cent.

TREATMENT. Ventriculin 30 Gm. daily.

PHASE OF REMISSION. On sixth day of treatment: RBC 2.0 million; Hemoglobin (Newcomer) 30 per cent; Reticulocytes 32.0 per cent (calculated rise for 1.5 million red blood cells at beginning of treatment = 22.3 per cent, exceeding expected rise by 9.7 per cent).

PROGRESS REPORT. On the twelfth day after Ventriculin was begun the following blood count was recorded: RBC 2.9 million; Hemoglobin 52 per cent; Reticulocytes 0.4 per cent. (Expected weekly increase = 500,000 red blood cells per cu. mm. Actual increase in this patient = 700,000 red blood cells per cu. mm.).

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THE TREATMENT OF ULCERATIVE LESIONS OF THE LARGE INTESTINE*

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The common ulcerative lesions of the large intestine which present themselves for differential study are chronic ulcerative colitis, amebic colitis, tuberculous colitis, benign and malignant new growths, and diverticulitis.[1] Any symptoms of intestinal dysfunction should bring one or all of these to mind, and careful differential diagnosis is the basis of accurate treatment.

The treatment of chronic ulcerative colitis readily divides itself into treatment for uncomplicated and treatment for complicated cases. All treatment is based on the underlying lesion (figs. 1, 2 and 3). Hence in uncomplicated cases of chronic ulcerative colitis, when diffuse involvement of the colon is the outstanding feature of the disease, systemic rather than local treatment, or a combination of the two, would seem wise.

TREATMENT

The evolution of the treatment of uncomplicated chronic ulcerative colitis has been slow. It is based on the probable etiologic relationship of a diplostreptococcus to the disease. Clinical knowledge of the disease has developed within a rather brief period. It was less than a decade ago that most students of the disease advocated surgical treatment. The pendulum is slowly swinging in the opposite direction, so that now the treatment in these cases is predominantly medical.

Physicians have gone through a period when irrigations with so-called intestinal antiseptics found favor. The almost invariable reply to the question concerning irrigation is that the amount of good accomplished is offset by the amount of irritation produced. This is along the lines of my experience. To accomplish much the intestine should be washed often, and even then the major features of the disease are not affected, for it is not an infection of the lining of the large intestine but rather of the whole wall.

The basis of rational treatment, then, should be measures which will combat the severe destructive inflammatory process. This has evolved the following plan of treatment: (1) immunization, vaccination or desensitization against the predominant bacterium found in these cases; (2) removal of all distant foci of infection, and (3) generous, liberal, high-calorie diet.

1. This is accomplished by administration, to patients who are less severely ill, of vaccines prepared from the diplostreptococcus, isolated from the rectal lesions of patients with the disease and, to patients who are more severely ill, a specific antibody solution (concentrated serum) prepared by immunization of horses. These measures of immunization, vaccination or desensitization have now

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* Abstract of papers read before Portland, Ore., Academy of Medicine, Cascade County Medical Society of Great Falls, Mont., Spokane, Wash., District Medical Society, and Seattle, Wash., Medical Society, Jan. 1931.

[1] Bargen, J. A.: Diseases of the Large Intestine. Jour.-Lancet, 50:75-80, Feb. 15, 1930.

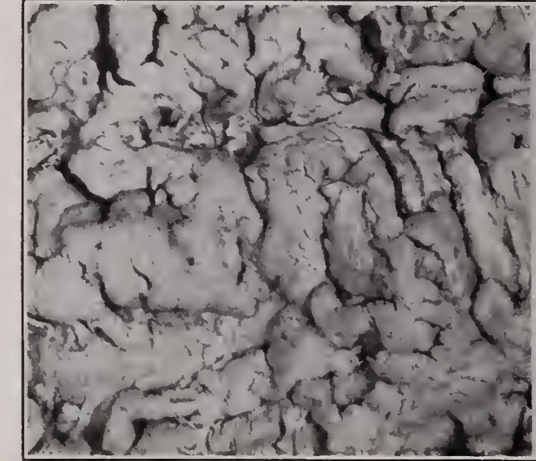

Fig. 1.

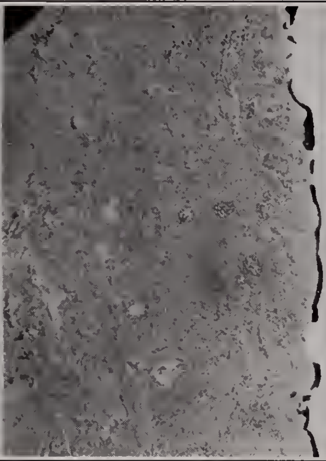

Fig. 2.

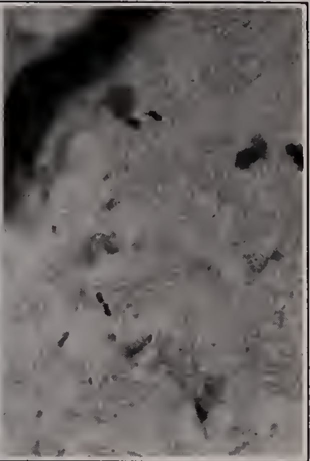

Fig. 3.

Fig. 1. A portion of the large intestine removed at necropsy, illustrating the diffuse involvement of the lesion of chronic ulcerative colitis.

Fig. 2. Section through the wall of the colon illustrates the replacement of mucosa by dense inflammatory tissue.

Fig. 3. Diplococci in the depths of the inflammatory tissue.

been carried out in a series of more than 600 patients, and although they leave much to be desired, the results surpass any obtained heretofore by other forms of treatment.

2. All demonstrable foci of infection should be eradicated as far as possible. Teeth with periapical abscesses, infected tonsils, and even tonsils that are suspected of being infected should be removed. Prostatic infection is difficult to treat in these cases and probably should not be tampered with.

3. What the patients should eat varies with the severity of the disease. Little digestion takes place in the large intestine, and unquestionably too much dietary limitation has been practiced in the past. Diet for the ambulatory patients, as employed at the clinic, consists of 3000 calories of foods of high-calorie value and relatively low residue. Attention is paid to an adequately balanced ration of vitamines. This diet will be varied in accordance with the activity of the disease. At times it has to be initiated by the administration of liquids only, but even these should be high in calories. Many of the patients tolerate milk poorly. Therefore, this is added to the diet only when patients, who have previously limited their diet, often to extreme degrees, begin to relish their food.

Administration of glucose intravenously and of solutions of sodium chloride subcutaneously occasionally become necessary in more severe, fulminating cases. Sedatives in the form of camphorated tincture of opium and codeine are helpful in cases in which there is much pain, tenesmus and frequent stools. The powders, such as bismuth, tribasic calcium phosphate and kaolin, are temporarily helpful. Hot abdominal stupes become necessary in rare instances. There are a number of drugs, the administration of which gives symptomatic improvement in selected cases. No single one that I have found helps more than a few patients. Among these, the most helpful in my practice have been iodine, gentian violet and arsenic. The last must be given with great caution because it may cause symptoms of arsenic poisoning early. or its administration may result in an acute exacerbation of the colitis. Once this happens, patients usually respond very poorly, if at all, to other medication. Consequently, arsenic should be held in reserve as a drug to try when other measures fail.

Surgery has a definite place in the treatment of chronic ulcerative colitis. I do not believe its final status has been determined. It used to be thought that ileostomy was the treatment of choice for the acute fulminating cases. The more of these cases I see, the less convinced I become of the value of ileostomy in this group. The mortality from enterostomy only is too high, and most of the cases respond to the present form of treatment with serum. As this is improved, it may supplant ileostomy. Strictures and polyposis often demand ileostomy and, at times, resection. Localized regions affected by chronic ulcerative colitis sometimes lend themselves to resection. Ileosigmoidostomy, cecostomy, appendicostomy, formerly employed as palliative measures, have gradually lost favor and are now rarely resorted to.

Complications, of which there are many, cannot be treated by following general rules. Polyposis, the most common one, often taxes the physician's ingenuity. The question of which polyps, or pseudopolyps, demand radical extirpation is often difficult to answer. As long as active disease is present the growths should be treated expectantly. When the active inflammation has subsided, or when in selected cases it is subsiding, and when it can be demonstrated that polyps are found only in the rectum and sigmoid, fulguration is the treatment of choice. However, too often large portions of the intestine are involved. Then radical colectomy must be considered, and if malignant change is suspected, colectomy must be done if possible. However, the desire to avoid undue loss of blood from trauma of the pedunculated mucosal tags also bears emphasis. If, after fulguration, there is early return of polyps, their ultimate nature should be viewed with alarm.

Colonic perforation occurs in 2.6 per cent of cases, and except for its small incidence is probably the most serious complication. Whether enterostomy should be performed at the first intimation of perforation or whether expectant treatment should be employed, is debatable. My experience suggests that, if surgical intervention is to be employed, it must be undertaken early.

Stricture occurs, usually in the rectum, and in varying degrees, in 8.5 per cent of cases. It may, however, involve any portion of the large intestine. I have observed a case of stricture at the ileocecal valve. If obstruction occurs in any portion of the large intestine, ileostomy is the treatment of choice; until this is performed, treatment should be expectant, actively directed against the colitis.

Perirectal abscess, and not uncommonly fistula, occur in 3.7 per cent of cases. These serious associated conditions should be treated conservatively. The least possible surgical intervention seems best. Local application of heat and cleansing of the wound after each discharge are helpful.

The other complications, such as arthritis, cutaneous lesions, renal insufficiency, endocarditis, splenomegaly, malignant disease, ocular inflammation and hemorrhage have been considered in another paper.

After ileostomy irregular but diffuse narrowing of the colon may ensue, so that a narrowed, useless tube, with pockets which retain pus, may be present. As a consequence, a patient may have recurrent chills and fever from septic absorption as well as such other systemic afflictions as arthritis. Such a tube as has been described (fig. 4) may in time become a real menace and demand radical extirpation with considerable risk.

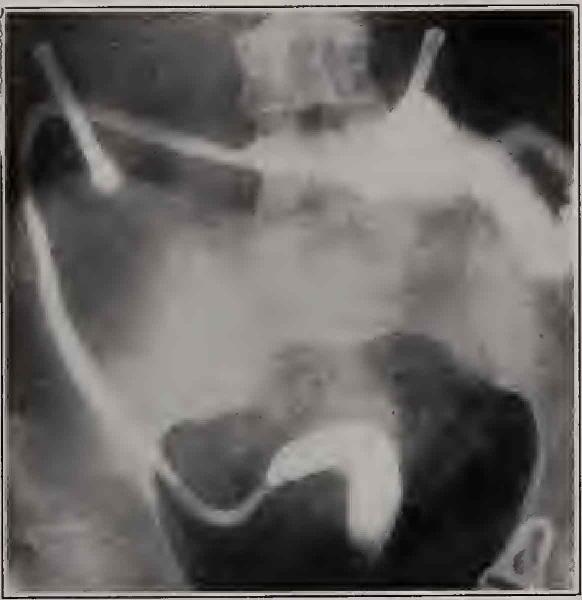

Fig. 4. Colon of a patient who has carried an ileal stoma for six years, resulting in a very narrow tube with several wider reservoirs of pus.

Finally, chronic ulcerative colitis is a serious infectious disease, carrying with it grave complications, which require much patience in handling. The nervous symptoms, often associated, demand perseverance, courage and patience. Much remains to be sought for in the control of this disease.

The treatment of intestinal tuberculosis is both surgical and medical. A formidable list of workers have advocated surgical treatment for the localized hyperplastic type of tuberculosis. Following the early successful extirpation of an ileocecal tuberculous lesion by W. J. Mayo,[2] many others have reported favorable results in hyperplastic intestinal tuberculosis, of resection or, if this was not feasible, at least of shunting the bowel around active or obstructive lesions by means of ileocolostomy. Archibald[3] has also advocated resection of localized ulcerative tuberculous lesions. He stated that ideal cases for operation are those with only involvement of the right side of the colon and of the terminal portion of the ileum, and that surgical contraindications include extensive pulmonary disease and extensive involvement of the small intestine.

The medical treatment of intestinal tuberculosis leaves much to be desired. Its success is almost directly proportional to early diagnosis of the disease. Hence one cannot stress too greatly the importance of the latter. That rest, as in tuberculosis of other organs, is desired, seems to be generally agreed. Stewart[4] advocated rest, a smooth diet, actinotherapy and drugs to relieve symptoms, and stated that surgery has small place, if any, in the treatment of tuberculosis of the intestine.

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[2] Mayo, W. J.: Localized Tuberculosis of the Intestine. N. Y. Med. Jour., 7:253-258, 1899.

[3] Archibald, E. W.: Surgical Treatment of Ulcerative Intestinal Tuberculosis as Occurring Chiefly in the Course of Pulmonary Tuberculosis. Can. Med. Assn. Jour,. 10:804-826, Sept., 1920.

On the other hand, Smithies, Weisman and Fremmel[5] suggested surgical exploration in all doubtful cases, and Bonafé[6] said that surgical exploration should often be resorted to. The former advised a diet low in residue and high in calories, omitting raw milk. If milk was used, it was to be citrated or parboiled. Malted drinks might be substituted and plenty of vitamines should be included.

Kline[7] and others also advocated a diet high in vitamines. Smithies said there should be no regard to fattening foods because these are not well borne, and the patient should be in bed until he had become afebrile and all dyspeptic symptoms had subsided. During the phase of active dysentery he advocated colonic irrigation. Larimore,[8] and Webb and Gilbert[9] also stressed the importance of attention to diet.

Davis[10] advocated heliotherapy applied over the whole body, whereas Erickson[11] reported marked improvement from treatment with ultraviolet light, and Talbot[12] felt this treatment was superior to heliotherapy. The German workers, particularly Kellner[13] and Reh,[14] obtained good results by roentgen therapy.

A large group of workers, including Jelks,[15] Laney[16] and Gleeten,[17] gave approval to the treatment of intestinal tuberculosis by injection of oxygen into the perineal cavity.

Among the drugs which have found favor in the treatment of intestinal tuberculosis, calcium, arsenic and mercury have their places. Gammons[18] has reported results with mercurochrome given intravenously. Bernard, Salomon and Thomas[19] reported favorably on the use of stovarsol and treparsol. Curti[20] has had some success with the use of calcium and parathyroid extract, and Ringer and Minor,[21] and Roberts[22] reported favorable results from long-continued intravenous use of calcium chloride.

The obvious conclusion from the fact that so many different measures have been advocated is that much remains to be done before a satisfactory form of treatment will be at hand, and that early diagnosis is of paramount importance.

Diverticulosis becomes ulcerative diverticulosis in only a small percentage of cases, and then the condition is usually associated with diverticulitis. When the condition is associated with obstruction or with local abscess, preliminary colostomy is usually necessary. Whether subsequent resection will be necessary, or whether the condition will subside with adequate local treatment in the form of rest of the part and warm irrigations, can be determined only by repeated, careful observations.

The treatment of polyposis presents a serious and diversified problem. Its solution depends on the type of polyps, age of the patient, amount of symptomatic disturbance and the patient's attitude toward life.

The polyps are multiple, and usually are found in young persons, but they may occur in children who are in the first decade of life. Radical extirpation is obviously the treatment of choice and its accomplishment may mean that a permanent ileal stoma must be established. If it becomes wise and necessary to perform ileostomy preliminary to total colectomy in treatment of a child, its training afterward is important. Symptomatic difficulties rarely develop before the third decade, however, and the question of earlier ileostomy needs to be decided only in rare instances.

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[4] Stewart, D. A.: Theses on Intestinal Tuberculosis. Am. Rev. Tuberc., 15:588-600, May, 1927.

[5] Smithies, Frank, Weisman, Morris and Fremmel, Frank: Tuberculous Enterocolitis. Tr. Sect. Gastro-Enterol and Proct., Am. Med. Assn., 79:176-199, 1928.

[6] Bonafe, L.: Essai de systematisation du traitement de la tuberculose intestinale chez le tuberculeux pulmonaire chronique. Paris med., 67:316-320, April 7, 1928.

[7] Kline, L. B.: Intestinal Tuberculosis. U. S. Vet. Bur. Med. Bull., 6:107-112, Feb., 1930.

[8] Larimore, J. W.: The Alimentary Tract in Pulmonary Tuberculosis. Jour. Mo. State Med. Assn., 26: 105-111, March, 1929.

[9] Webb, G. B. and Gilbert, G. B.: Tuberculous Enteritis; the Dietetic Management. Tr. Nat. Tuberc. Assn., 20:121-125, 1924.

[10] Davis, W. C.: Intestinal Tuberculosis. Early Diagnosis and Effective Treatment. U. S. Vet. Bur. Med. Bull., 2:660-668, July, 1926.

[11] Erickson, R. J.: Effect of Ultraviolet Light Treatment on Symptoms of Intestinal Tuberculosis. Am. Rev. Tuberc., 12:15-28, Sept., 1925.

[12] Talbot, B. L.: Observations on Intestinal Tuberculosis. U. S. Vet. Bur. Med. Bull., 4:778-781, Sept., 1928.

[13] Kellner, F.: Zur Roentgenstrahlentherapie der lokalisierten Tuberkulose des Darmtraktus. Beitr. z. Klin. d. Tuberk., 60:644, 1924-1925.

[14] Reh, Hans: Roentgenheilung ausgedehenter Ileocoecaltuberkulose. Zentralbl. f. Chir., 49:1661-1665, Nov. 11, 1922.

[15] Jelkes, J. L.: Tuberculous Enteritis Treated by Intraperitoneal Injections of Oxygen. Case Report. Tr. Am. Proctol. Soc., 23:66-70, 1922.

[16] Laney, R. L.: Oxyperitoneum. Minn. Med., 9:323-326, June, 1926.

[17] Gleeten, S. D.: Treatment of Tuberculosis of the Intestine by Oxyperitoneum, with Report of Cases. Atlantic Med. Jour., 29:162-165, Dec., 1925.

[18] Sammons, H. F.: Mercurochrome-220 in Intestinal Tuberculosis. Med. Jour. and Rec., 128:533, Nov. 21, 1928.

[19] Bernard, Leon, Salomon, M. and Thomas, M.: Traitement des diarrhees des tuberculeux et de l'enterite bacillaire par les arsenicaux pentavalents (stovarsol et treparsol). Bull. et mem. Soc. med. d hop. de Par., 49:419-425, March 13, 1925.

[20] Curti, Orlando: Sobre tuberculosis intestinal. Tratamiento calcicoparatiroideo. Semana med., 32:874-875, April 16, 1925.

[21] Ringer, P. H. and Minor, C. L.: The Intravenous Injection of Calcium Chloride in the Treatment of Intestinal Tuberculosis. Tr. Am. Climat. and Clin. Assn., 36:128-135, 1923.

[22] Roberts, E. H.: Some Observations on the Calcium-chloride Treatment of Tuberculous Enteritis. Am. Rev. Tuberc., 9:159-172, April, 1924.

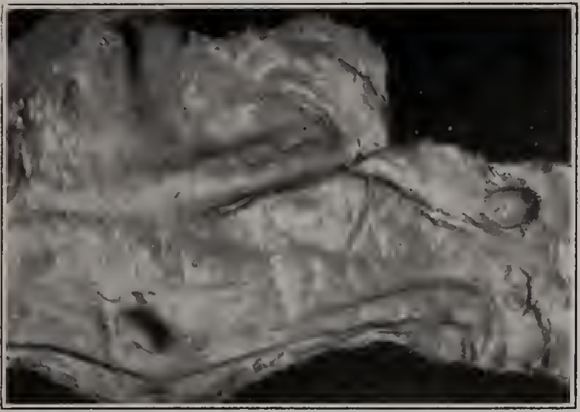

Fig. 5. Portion of a colon with multiple so-called pseudopolyps.

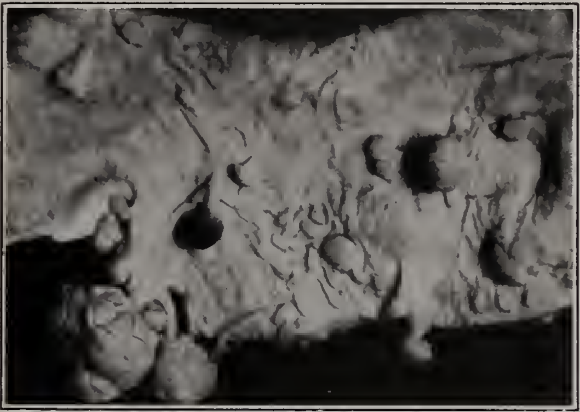

Fig. 6. Portion of a colon with multiple adenomatous polyps.

When polyps occur secondarily to inflammatory disease, such as chronic ulcerative colitis, the important decision rests between the probability of malignant change and the surgical risk of radical extirpation. Hence it is of vast importance to determine whether the polyps are the so-called pseudopolyps of inflammatory origin or whether they are of the congenital neoplastic type (figs. 5 and 6).

Amebiasis, amebic ulceration and amebic colitis are strictly medical problems involving the large intestine. Their treatment, when uncomplicated, is gratifying. Some form of ipecac and of arsenic has given the best results. Of the former, emetine hydrochloride often has resulted in striking immediate subsidence of symptoms. Followed by, or given with, stovarsol or treparsol, permanent cures have been obtained in the majority of cases.

SUMMARY

Ulcerative lesions of the large intestine present some of the most difficult clinical problems. Adequate treatment depends on correct diagnosis.

In most cases, treatment is by medical and surgical measures combined. The closest cooperation between surgeon and clinician is imperative.

FURTHER STUDIES IN THE RELATIONSHIP OF HEPATITIS TO CHOLECYSTITIS*

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Blackstein[1] in 1891 obtained bacteria from the bile after injecting them into the blood stream. This would indicate that hepatitis might be produced by organisms circulating in the blood stream and then escaping into the bile producing cholecystitis, as was suggested by Birch-Hirchfeld[2] in 1895. That this is not the usual way was shown by Else[3] in October, 1909 and 1910, and by Chiarolanza[4] in December, 1909. Koch[5] in 1908 reported the finding of clumps of bacteria in sections made from the wall of a gallbladder. Rosenow[6] in 1916 by painstaking culture study confirmed the observations of Koch and the work of Else and Chiarolanza. Meyers, Neilson, Feusier[7] in 1921 found that, when organisms were injected into the general circulation, the same number of germs per gram of substance was obtained from the gallbladder wall and the liver. This would indicate that a simultaneous hepatitis and cholecystitis might develop from the blood stream infection.

Although the lymphatics of the gallbladder were carefully studied by Sudler[8] in 1901, and Sappey[9] described them again in 1909, little attention was paid to their importance in the relationship between hepatitis and cholecystitis until Graham and Peterman[10] observed in 1922 that hepatitis in the vicinity of the gallbladder was almost a constant accompaniment of cholecystitis. Kodama[11] in 1926 arrived at the following conclusions relative to the relationship of the lymph vessels and the gallbladder: "(1) Some of the lymph vessels of the liver, gallbladder, duodenum, pancreas, and appendix enter the lymph glands which are located about the portal vein; (2) the lymphatic connection of the liver and gallbladder is made in the parenchyma and capsule of the liver." Winkenwerder[12] in 1927 reported that in the cat there was no opportunity for the lymph to flow freely between the lymphatics of the gallbladder and those of the liver. Graham, Cole, Copher, and Moore[13] in 1928 advanced the theory that cholecystitis was frequently due to an extension of the infection from the liver to the gallbladder through the lymphatics.

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* Read before the Forty-first Annual Meeting of Washington State Medical Association, Mount Baker Park, Wash., Sept. 2-3, 1930.

[1] Blackstein: Johns Hopkins Bull. 2:66 and 121, 1891.
[2] Birch-Hirchfeld: Lehrbuch, d. Path. Anat. Ed. 4, p. 694.
[3] Elst, J. E.: S., G., and O., 9:612, 1909; ibid. 11:470-472, 1910.
[4] Chiarolanza: Ztschr. f. Hyg. u. Inf., 62:12, 1909.
[5] Koch, J.: Ztschr. f. Hyg. u. Inf., 62 Pt. 1, 1909.
[6] Rosenow, E. C.: J. Infec. Dis., 19:527, 1916.
[7] Meyers, Neilson, Feusier: J. Infec. Dis., 28:456, 1921.
[8] Sudler, M. T.: Bull. Johns Hopkins Hosp., 12:126, 1901.
[9] Sappey: Traite d. Anatomie Povier, p. 1226, 1909.
[10] Graham and Peterman: Arch. Surg. 4:23, 1922.
[11] Kodama: S., G. and O., 13:145-146, 1926.

Else, Rosenblatt, and Davis[14] in 1929 showed that, when an inert substance (india ink) was injected into the retrogallbladder space, it was readily carried into the liver substance by the lymphatics, but when injected into the gallbladder was retained within it and did not extend even into the retrogallbladder space. When injected into the gallbladder wall adjacent to the liver, it was carried into the liver, but it is not certain that it was carried from the gallbladder wall into the retrogallbladder space through the lymphatics. It is possible that by mechanical pressure it reached the retrogallbladder space, as the work was done on living animals and to dissect out the gallbladder wall would have broken the lymph chain. The work suggested, however, that an infection in the gallbladder wall, if sufficiently virulent, would penetrate the wall by direct extension and undoubtedly would be picked up by the lymphatics and carried into the liver.

The present work was undertaken to determine the action of organisms within the gallbladder and liver. Three series of experiments were run. In the first a fresh culture of bacillus pyocyaneus was injected into the gallbladder after the cystic duct had been tied. In the second series the lymphatic connections, if present, were broken by dissecting the gallbladder free from the liver and inserting the greater omentum, and then injecting organisms into the gallbladder after ligating the cystic duct. In the third series the organisms were injected into the liver substance two centimeters from the retrogallbladder wall.

Series 1. Dog No. 1 Cystic duct was ligated and bacillus pyocyaneus injected into the lumen of the gallbladder. Dog sacrificed fifty-four days later. The gallbladder and wall were completely hidden from view, due to the liver having wrapped itself completely around the gallbladder. The liver showed considerable cloudy swelling, it being more marked in the immediate vicinity of the gallbladder. Cellular infiltration was present. An active cholecystitis was present with sloughing of the mucosa and infiltration of the wall. The pancreas was normal.

Dog No. 2. The cystic duct was tied and bacillus pyocyaneus injected into the lumen and wall of the gallbladder. The dog was sacrificed fifty-two days later. The gallbladder was entirely hidden from view by the liver having wrapped itself around it. The liver showed hepatitis in the immediate vicinity with cloudy swelling and cellular infiltration and some fibrosis. The gallbladder showed an active cholecystitis with numerous small abscesses in its wall. The appendix was curled in the form of a spiral, twisting upon itself twice. The loops were held together and to the ileum by adhesions. No evidence of infection was found elsewhere in the peritoneal cavity. The pancreas was normal.

Dog No. 3. The cystic duct was tied and bacillus pyocyaneus was injected into the wall of the gallbladder. The dog was sacrificed eighteen days later. The gallbladder was hidden from view by the liver which had wrapped itself around it. The liver showed definite hepatitis with cloudy swelling, cellular infiltration and some necrosis. The gallbladder showed an acute cholecystitis with a thickening of the fibrosa and edema with cellular infiltration of the entire gallbladder wall. The pancreas was normal (figs. 1, 2, 3).

Dog No. 4. Bacillus pyocyaneus was injected into the lumen and wall of the gallbladder but the duct was not tied. The dog was sacrificed twenty-eight days later. The gallbladder was entirely hidden from view by the liver and great omentum which were adherent to it. They were also adherent to the anterior abdominal wall. The liver and gallbladder were approximately normal in microscopic appearance. There had evidently been an acute inflammation following injection of the organism, but as the cystic duct had been left open there was free drainage, and the inflammatory process was practically healed at the time the dog was sacrificed. The appendix was coiled upon itself and adherent to the intestines.

Dog No. 5. Bacillus pyocyaneus was injected into the lumen and wall of the gallbladder. The cystic duct was

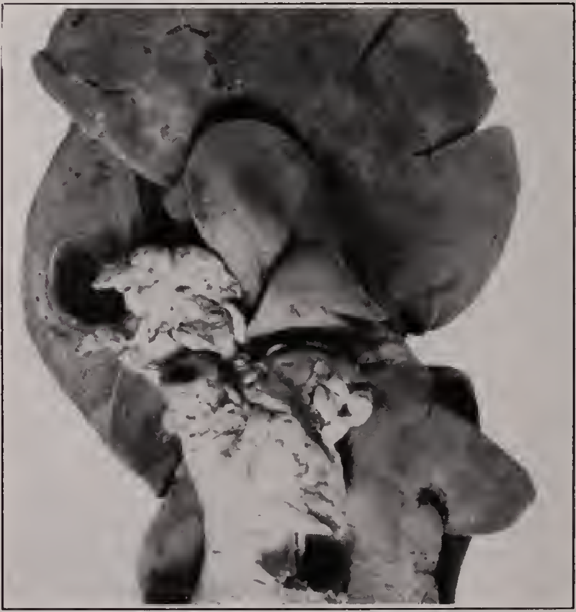

Fig. 4. Dog No. 5. Series I. The gallbladder was entirely surrounded by great omentum and liver substances. The appendix in this animal also showed acute inflammation.

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[12] Winkenwerder: Bull. Johns Hopkins Hosp., 41: 226-238, 1927.

[13] Graham, Cole, Copher, Moore: Diseases of the Gallbladder and Bile Ducts, p. 126, 1928.

[14] Else, Rosenblatt, and Davis: North. Med., 29:252, 1930.

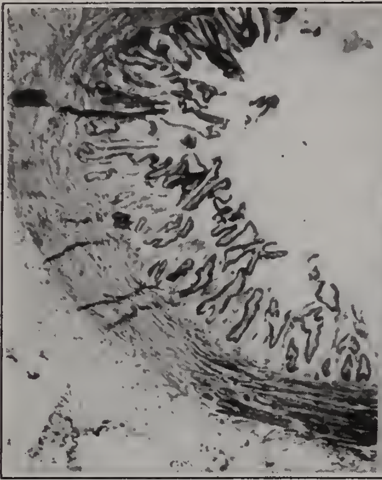

Fig. 1.

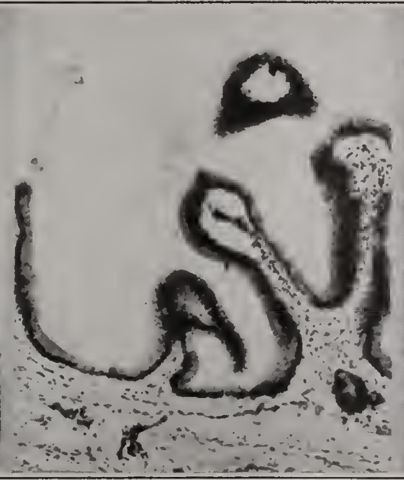

Fig. 2.

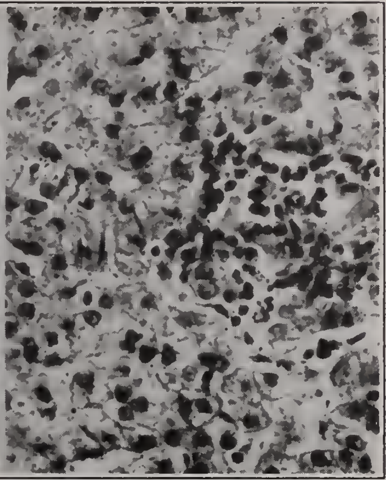

Fig. 3.

Fig. 1. Dog No. 3. Series I. Note the marked edema in the gallbladder wall and retrogallbladder space.

Fig. 2. Dog No. 3. Series I. Same dog as in fig. 1, higher power. Note the marked edema throughout the entire gallbladder wall.

Fig. 3. Dog No. 3. Series I. High power of the liver substance in the vicinity of the gallbladder, showing cloudy swelling and cellular infiltration.

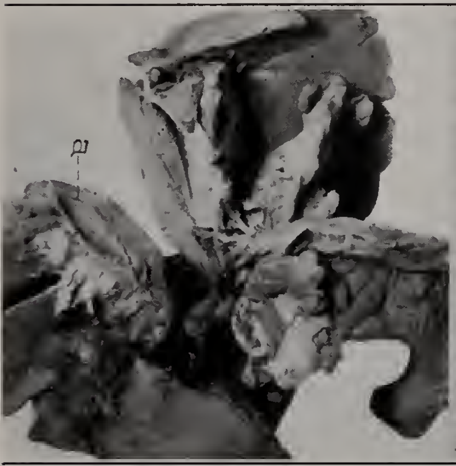

Fig. 5.

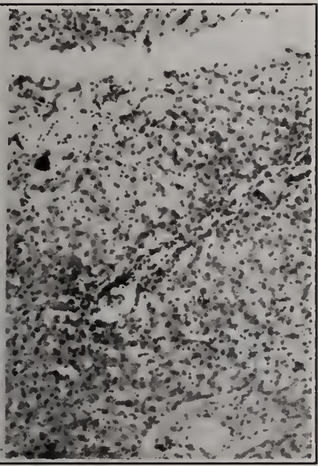

Fig. 6.

Fig. 5. Dog No. 2. Series II. The gallbladder, a, is seen to be surrounded by the liver and greater omentum. The microscopic examinaton showed an active cholecystitis and numerous small abscesses in the gallbladder wall and hepatitis of the liver in the immediate vicinity.

Fig. 6. Dog No. 2. Series II. Same dog as in fig. 5. Note the cloudy swelling and round cell infiltration.

tied. The dog was sacrificed seven days later. The gallbladder was entirely hidden from view by liver substance. The gallbladder wall and liver showed cloudy swelling and cellular infiltration. The appendix was coiled and covered with recent adhesions and the lumen filled with an emerald colored exudate (fig. 4).

Series II. Dog No. 1. The gallbladder was dissected free from the bed and great omentum sutured to the liver. The cystic duct was tied and bacillus pyocyaneus injected into the lumen and wall of the gallbladder. The dog died three days after the operation from a general peritonitis.

This was the only dog in the entire experiment that developed a peritonitis, so was excluded from the series, because it was impossible to determine which changes were due to the injection within the gallbladder and which were due to general peritonitis.

Dog No. 2. The gallbladder was dissected free from the liver and great omentum sutured in its bed. The cystic duct was ligated and bacillus pyocyaneus was injected into the lumen and wall of the gallbladder. The dog was sacrificed forty-eight days after the operation. Only the tip of the gallbladder was visible, the remainder being surrounded by liver substance and great omentum. A very acute cholecystitis was present. There was marked cellular infiltration in the entire gallbladder wall. Small abscesses were found in the serosa. A small amount of cloudy swelling and cellular infiltration were present in the surrounding liver substance. There was considerable fibrosis in the immediate vicinity of the gallbladder. The pancreas was normal. Diagnosis, marked cholecystitis and slight hepatitis (figs. 5 and 6).

Dog No. 3. The gallbladder was dissected free from the liver and great omentum sutured in the bed. The cystic duct was not tied. Bacillus pyocyaneus was injected into the lumen and wall of the gallbladder. The dog was sacrificed twenty-eight days after operation, at which time the gallbladder was hidden from view, being surrounded by liver and great omentum. The gallbladder wall was thick and showed a very marked infection. The liver showed extensive involvement. Small abscesses were present. There was cloudy swelling throughout the liver. The pancreas was normal.

Dog No. 4. The gallbladder was dissected free from the bed of the liver and great omentum sutured in the bed. The cystic duct was tied and bacillus pyocyaneus injected into the lumen and wall of the gallbladder. The dog was sacrificed twenty-eight days later, at which time the gall-

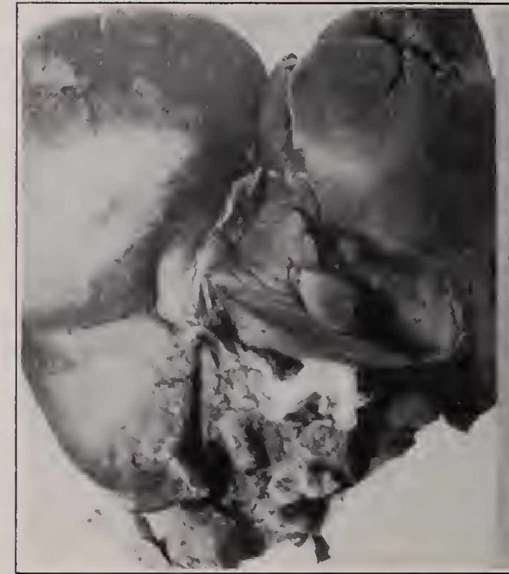

Fig. 7.

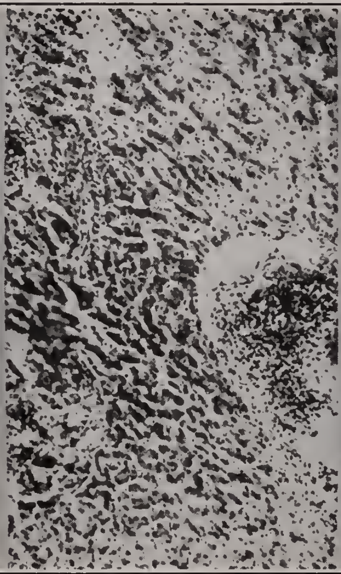

Fig. 8.

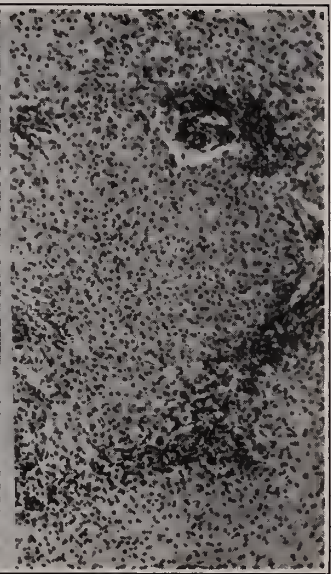

Fig. 9.

Fig. 7. Dog No. 6. Series II. The gallbladder was completely encased in great omentum and bacillus pyocyaneus injected into it.

Fig. 8. Dog No. 6. Series II. Same dog as in fig. 7. From a section of the liver in the immediate vicinity of the place where the culture was injected, showing edema, round cell infiltration and necrosis.

Fig. 9. Dog No. 6. Series II. Same dog as in fig. 7, showing edema and round cell infiltration around the larger bile ducts in the liver.

bladder was partially hidden from view by the liver. The serosa was thickened and a large abscess was found in it. There were small abscesses in the mucosa and cellular infiltration in the immediate vicinity of the wall. The liver shows a slight cloudy swelling but no cellular infiltration. The pancreas was normal. Diagnosis, marked cholecystitis and fairly normal liver.

Dog No. 5. The gallbladder was dissected free from the liver bed and great omentum sutured in the bed. The cystic duct was tied and bacillus pyocyaneus injected into the wall of the gallbladder. Twenty-one days later the dog was sacrificed. at which time the gallbladder was completely covered by liver. There was marked injection of both the gallbladder and liver. Numerous abscesses were found in the liver substance in the vicinity of the gallbladder. Cloudy swelling and cellular infiltration were present.

Dog No. 6. The gallbladder was dissected free from the bed of the liver and completely encased in great omentum. The cystic duct was tied and bacillus pyocyaneus injected into the lumen. The dog was sacrificed thirty days later, at which time the gallbladder was found to be in the omentum cast and the omentum adherent to the liver and partially surrounded by it. There was marked cholecystitis and infection of the liver (figs. 7, 8, 9).

Series III. Dog No. 1. The liver and gallbladder were exposed. The gallbladder at this time was bluish-grey in color, smooth, and freely movable in its bed. One cubic centimeter of fresh twenty-four-hour pyocyaneus broth culture was injected into the liver about two centimeters from the gallbladder. The incision was then closed. Seven days later the dog was sacrificed and the liver and gallbladder removed in toto. Grossly a speckled area on the liver suggests the point of injection. Cut sections at this point reveal a brownish area about one-half cm. across, one cm. beneath the surface. The gallbladder is pale in color and is covered externally with adhesions and small areas of greyish yellow material. Cut sections show the walls of the gallbladder to be thickened. Microscopic sections of the gallbladder reveal marked leucocytic infiltration of the wall, especially the mucosa. The gross and miscroscopic findings show definite evidence of cholecystitis (fig. 10).

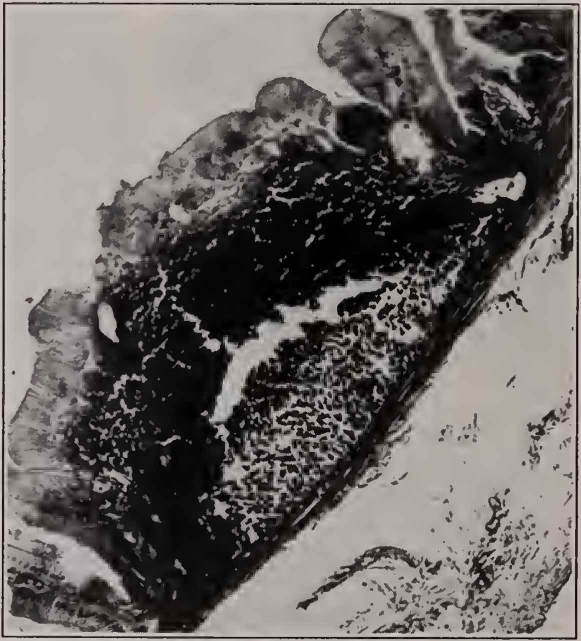

Fig. 10. Dog No. 1. Series III. A culture of bacillus pyocyaneus was injected into the liver about 2 cm. from the gallbladder. Note the marked round cell infiltration and beginning abscess formation in the mucosa.

Dog No. 2. The liver and gallbladder were exposed. The gallbladder was found to be bluish-grey in color, smooth, and free in its bed. One cc. of the same pyocyaneus broth culture used in dog No. 1 was injected into the liver, about 2 cm. from the gallbladder. The culture used in this case had been out of the incubator for twenty-four hours. The dog was sacrificed ten days later and the liver and gallbladder removed in toto. Grossly the liver shows no evident changes. The gallbladder is bluish-grey in color and reveals numerous thin brittle adhesions attaching it to the liver. Cut section reveals very slight thickening of the wall. Microscopically sections of the gallbladder show no evidence of inflammatory change. The gross findings reveal evidence of slight cholecystitis. The miscroscopic findings are negative.

SUMMARY

In four of the dogs in series I, in which the organisms were injected into the gallbladder without freeing it, and the cystic duct ligated, hepatitis as well as cholecystitis was present in all, showing that, in an active cholecystitis, injection readily extends into the surrounding liver substance. In one dog, in which the cystic duct was not ligated, there had been an active injection, but twenty-eight days later when the dog was sacrificed, the liver and gall-bladder were approximately normal other than for the adhesions. This was interpreted to mean that, because of the free drainage through the cystic duct, the flow of bile in and out soon diluted the culture to such an extent that the gallbladder healed from the infection. The inflammation of the liver also healed.

Series II. The breaking of the lymphatic connection, if any, between the gallbladder and the liver by dissecting the gallbladder loose and placing omentum in its bed, did not prevent infection from reaching the liver. In dogs Nos. 2, 3, 4 and 5 the liver had become adherent to the gallbladder, so there was direct extension from the gallbladder wall into the liver substance, and in one of them direct extension through the great omentum. After the infection reached the liver substance it was probably carried by the lymphatics. In dogs 3 and 5 there was a marked hepatitis with abscess formation. In dog No. 2 there was only a slight hepatitis. In dog No. 4 the liver showed only a slight cloudy swelling. In dog No. 6, in which the gallbladder was completely encased in the great omentum so there was no opportunity for infection to reach the liver except by penetrating the great omentum, there was evidence of infection of the liver. In no dog in this series was the liver perfectly normal.

Series III. In the third series only two animals had been operated on at the time this paper was read. In the one in which the very virulent organisms were injected into the liver substance, there was very definite cholecystitis present and in the one in which an attenuated culture was injected, no necrotic changes were found in the gallbladder, but there were some adhesions between it and the liver.

In every dog in the combined series, regardless of whether the gallbladder was dissected free from its bed or not, or whether the organisms were injected into the gallbladder or into the liver, there was evidence of transmission of infection from the gallbladder to the liver in the first two series and from the liver to the gallbladder in the third series. In the second series, in which the only possible lymph connections between the gallbladder and the liver were broken, infection reached the liver by direct extension. In the sixth dog of this series, in which the gallbladder was completely encased in great omentum so there was no opportunity for the liver to come into direct contact with it, infection occurred by direct extension to the liver surface.

CONCLUSIONS

1. Infection readily goes from the gallbladder to the liver.

2. The presence of actual lymph channels between the lymphatics of the gallbladder and those of the liver is of academic interest only, as infection in the gallbladder will reach the liver even when separated by the great omentum.

3. When infection reaches the liver surface, it probably goes into it through the lymphatics, as inert substances which cannot go by direct extension are readily carried into the liver.

4. Infection of the gallbladder from the immediate liver vicinity occurs.

5. When an attenuated organism is injected into the liver substance, it does not travel as readily as when virulent organisms are injected into it.

6. We do not believe that cholecystitis in the human is usually due to transmission of organisms through the lymphatics or by direct extension from the liver substance, because experimentally we found that there was pronounced hepatitis in the immediate vicinity of the gallbladder, similar to the finding of hepatitis in the vicinity of acute cholecystitis in the human. If the infection in cholecystitis in the human usually came from hepatitis, the liver involvement would be uniform and not most pronounced about the gallbladder.

7. The pancreas was normal in every instance, showing that an infection of the pancreas, at least experimentally, does not readily extend by the lymphatics from the liver or gallbladder. The cystic duct being tied, there was no opportunity for infection to travel by retrograde extension into the duct of Wirsung.

8. In three animals there was involvement of the appendix. We have made no study to determine its cause.

GALLBLADDER OBSERVATIONS

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As a basis for this paper, I have taken a synopsis of the case records of one hundred and thirty cases, treated mostly surgically, and all with a diagnosis of some gallbladder condition, primary or secondary, in an open hospital. Open hospitals in our part of the world have not yet come to the point of having as complete records of the means of making diagnosis as closed hospitals, nor do they have, assume or demand as good a standard of diagnostic study previous to operation as is desirable. They forget, or perhaps never did realize, that they have a moral responsibility to the patient whom they admit. They are willing to try to provide equipment, but do not seem to be willing to dictate that it shall be properly used.

Accordingly, that which I may say about the records in these cases may be unjust, because they have been treated by men of a good deal of variation in medical school training, in hospital training and in personal experience. If any errors were made, I would not like you to think they were all made by men who have not had the best opportunities to learn, for it has been observed from the study of this group that the cases, in which the laboratory examination has demonstrated the least pathology, and the records have shown the fewest preoperative symptoms and the most common neglect of the use of diagnostic means available, have been in the hands of men who have had the best opportunities afforded.

Another point, in which this summary may not be fair, is that there is not any follow-up, so that one may judge if the patient received any material benefit from the operations performed. This is a particularly desirable point in the cases that were operated upon and revealed no or very little laboratory pathology.

The discovery of the value and use of a dye to estimate the function of the gallbladder, or rather the condition of its wall, was a great event. Perhaps the results have not been universally accepted and standardized, and no doubt there are those who place no confidence in it. It is safe to say that it is at least an aid, and that if after its administration, the gallbladder form gives a distinct and definite shadow, the circulation in it is fairly good; and if the form of the gallbladder does not show in a shadow, some disease has prevented the absorption of the dye, and in the present state of our knowledge a failure to secure a shadow is presumptive evidence that there is or has been disease of the gallbladder.

It would be foolish to say that all gallbladder cases should be roentgen-rayed, for there are many cases so palpably pathologic from a clinical standpoint, that it is not fair to one's patients to put them to the expense and inconvenience of such an examination; nor do I believe it is good for a surgeon to feel from a clinical standpoint that he is not capable of making a diagnosis in a frank case of gallbladder disease. Laboratory methods can never supplant in diagnosis what a correct evaluation of positive symptoms should tell us. On the other hand, in cases of doubt resort to laboratory facilities and for the subject at hand the roentgenogram facilities often will keep us from doing a serious injustice to a patient.

As an example: A man presented himself with a pain under his right costal margin, a certain amount of tenderness, complaining of gas after eating, and likewise some general gastric distress and pains at night. It appeared that he probably had chronic cholecystitis. He was ready to be operated upon, and especially so, since he had received the same diagnosis from others. But he was advised there might be an error, and that he should have a roentgenogram made, when it was discovered that he had a chronic arthritis in the dorsal vertebrae.

I have made a review of these cases, omitting some upon whom had been made a diagnosis of cholecystitis, where the history gave no evidence of any disease of the gallbladder, and some in whom, though disease of the gallbladder was not suspected, stones had been discovered in the course of a laparotomy for other purposes.

Of all these cases roentgen reports were recorded in thirty-three, and none in ninety-five. In cases of chronic cholecystitis there were twelve in which roentgen reports were recorded, and thirty-nine cases in which there was no such report. Of these cases there were twenty-two in which the pathologic examination, after removal of the gallbladder, failed to show any pathologic changes. This latter statement must be tempered by the explanation that a few reports spoke of a very slight cholecystitis, and one of a strawberry gallbladder. In conversation with the pathologist about these reports, he has stated that the cases of very slight cholecystitis can be considered as normal gallbladders.

It would appear, then, that an operation might have been avoided had roentgen examination been

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made in this group of twenty-two cases, where no pathology was found. This condition is the more serious, since in one of these cases with no pathology death occurred. There was a group of six cases that had been subjected to roentgen examination and were not operated upon, in which a working diagnosis of chronic cholecystitis had been made. In two cases another diagnosis was demonstrated by that means and in the other four the report was negative.

Of the cases with roentgen reports that were diagnosed chronic cholecystitis and operated upon, the following is perhaps of interest. The individual case reports say that the roentgen examination suggested the deformity of the duodenum; another report made a year previously showed an elongated slender gallbladder which emptied poorly; another one failed to show any gallbladder shadow; another showed a possible gallbladder condition; another one showed one large stone; another report says that the patient had a chronic appendicitis and chronic cholecystitis, and when these cases were operated upon there was no disease found in the gallbladder. Of these it is impossible to tell what the findings were upon the plates, since practically in all there is no copy of the report of any one especially trained, at any rate in roentgen-ray work, and these notes were all made from references by the operating surgeon.

The diagnosis of all those cases was chronic cholecystitis and the common run of histories in them were belching of gas, pain after eating, pain under the right costal margin and tenderness over the gallbladder. Some of these people had been treated for stomach trouble of one sort and another for quite a while. Some complained of a certain degree of tenderness over the gallbladder, and in one there was marked tenderness in the angle of the ninth and tenth ribs. In one was a statement that it was thought possible to feel the gallbladder. The other group of cases, in which no roentgen-ray study was made, consisted of much the same set of symptoms.

The point I wish to make in bringing out this group of cases is that the majority present practically no definite symptoms and those they describe remind me of the replies of patients to inquiries about biliousness. Soon after I began practicing medicine, I read a little book by an Englishman on "Slight Ailments." One of these which was described in more or less detail was biliousness. Ever since, when patients have come to me and said they were bilious, I have asked for a detailed statement of the symptoms that would lead them to think they were suffering from biliousness. Quite a large number had no definite statement to make. They just didn't feel right or they had a little gas in the stomach. They thought they were a little sallow or they had indigestion of one sort or another. Perhaps they could not handle greasy foods; perhaps they suffered headache, pain in the back, a little soreness upon moving and so forth.

It seems to me the symptoms related in this set of cases could well come under the type of biliousness. The author of this book, whose name I have forgotten, lived in a period when medicine for biliousness was more actively used than it is now. I remember that calomel was a very common drug for his use. The era of medical knowledge in which he lived did not possess the pathology of the gallbladder and its ability to produce the symptoms that ours does, nor did he have the opportunities and means of diagnosis that we have. Perhaps had he had them, in place of making a diagnosis of biliousness, he would have made one of chronic cholecystitis. I think he was a more or less old fashioned sort of doctor, and a diagnosis of chronic cholecystitis in his hands might have been much safer for a patient then than it is in the hands of a more modern and enthusiastic surgeon.

One of these cases also gives this sort of history: Recurring attacks of jaundice. Thirteen years ago had his first attack with nausea. Attacks of nervousness from business worries, with a moderate degree of tenderness over gallbladder. The probabilities are that case would not even have received the diagnosis of biliousness. The only thing relative in the case was that at one time he was jaundiced and nauseated.

In reviewing the group of cases that were operated upon and no pathology found afterwards, it appears there is not one that should not have been considered as belonging to the border line class, that is, a group in which there is very grave doubt about the correctness of a diagnosis of gallbladder disease of any kind. If any patients should be subjected to laboratory methods, those belonging to this group are the ones.

There were six cases with a diagnosis of chronic cholecystitis, in which roentgen examinations were made and the patients were dismissed without operation. The type of history in these is very instructive, for it is the same as for those cases which were diagnosed as cholecystitis, were operated upon, and in which nothing was found.

Take a typical case. There were nausea, vomiting, headache, pain in back and lower chest, and over gallbladder, the pain extending into right side of back, indigestion, tenderness, rigidity over gallbladder and epigastric region. The roentgen examination showed a normal gallbladder. Perhaps another is a more typical history. There were noted nausea, vomiting, pain in right upper quadrant, belching of gas, occasional constipation, light colored stools, no jaundice, no colic; influenza three months ago, right rectus moderately rigid in both upper and lower quadrant. The roentgen examination resulted in a diagnosis of prepyloric ulcer.

There were eleven cases of chronic cholecystitis operated upon, in which no roentgen examination was made, where the diagnosis proved to be correct from a laboratory standpoint. The history is much the same as that of the others. There were pain in right side of abdomen and back, belching of gas, indigestion, vomiting, constant pain for two weeks and tenderness over the gallbladder. It is to be noted that these symptoms are similar to those in the cases where there was nothing wrong. It will be noted there were eleven of these cases, and twenty-two of the other. Thus, out of a total of thirty-three cases, there was an opportunity to be right in 33 per cent. Or, in other words, of those cases that were not subjected to laboratory diagnostic methods, only 33 1/3 deserved surgical interference.

No doubt there may be some relationship that we do not yet understand between conditions existing in the gallbladder and the upper part of the digestive tract through the nerve plexuses. We know that the left pneumogastric supplies fibres to the musculature of the pyloric end of the stomach and it sends branches to the hepatic plexus. Through the same sort of relationship it has been clinically and physiologically demonstrated that pyloraspasm may depend on chronic appendicitis. It would not be unreasonable to attribute the same relationship to disease of the gallbladder wall and pyloraspasm or other gastric disturbances. If this be true, and it is possible to demonstrate by means at hand the existence of gallbladder wall disease, it is perfectly justifiable to remove the gallbladder with the expectation that the digestive symptoms will be relieved. As an additional basis for this assumption, we can point to the relief obtained by operation on gallstone cases, in which there has been and is at the time of operation chronic or acute inflammation of the gallbladder wall. An occasional observer has gone so far as to say that bacteria may be present in the wall and produce this relationship of cause and effect, without producing demonstrable changes in the tissue in which they exist, and can only be demonstrated by cultural means.

In regard to blood pressure. A good deal has been written in the last few years regarding focal infection as a cause of conditions that produce elevation of the blood pressure. Among other focal infections supposed to cause this has been cholecystitis. Consequently I ran over the cases which we have, though of course I know they are few in number and should not be made a basis for any positive statement as to the relationship of blood pressure and chronic cholecystitis. Yet it is probable that much the same relationship would run between this small group and a larger one that might be collected.

The larger group, consisting of twenty-three cases of chronic cholecystitis, showed a systolic pressure between 120 and 140. These were not recorded by their ages, but as to systolic blood pressures above 160. There was only one case, and that was a patient 62 years of age. The blood pressure was not recorded on a number of charts and so the group is limited, but there were 50 cases of chronic cholecystitis with only one systolic pressure above 160 and only seven cases above 150. In this group also were two cases in which there was a pulse pressure less than 30.

In the cases of cholecystitis with stones, there were thirty-seven in which the blood pressure was recorded. Fifteen were between 120 and 140 systolic and nine cases in which it was 160 to 170. Two cases were over 200, and of those above 160 one occurred between the ages of 30 and 40, four between 50 and 60, and six between 60 and 70. In other words, the elevation of blood pressure in these cases practically was present only in those people who were fifty years old and over, and of this group there was one of a pulse pressure of less than 30, in whom death followed the operation. If we take the entire group of eighty-seven cases, in which the blood pressure was recorded and not those over 160 systolic, we may say that all but one were over fifty and all but seven over sixty. There were only three cases in whom the pulse pressure was less than 30, one of whom died, following the operation.

As to the age of the patients in various groups, the following table will be of use:

Ages	Chronic cholecystitis with stones	Chronic cholecystitis	Cases operated upon. No pathology	Chronic cholecystitis. No operation
20-30	6	2	2	7
30-40	9	3	10	4
40-50	13	4	6	5
50-60	20	5	7	4
60-70	6	2	3	1
70-....	4	1	0	0

Of the cases operated upon, then, it would appear that people in the decade between twenty and forty had more operations in which there were normal gallbladders than at any other age. People between forty and sixty were more liable to show a positive cholecystitis than at other ages, and those between forty and sixty were more liable to show cholecystitis with stones than at other ages. The inference, that it seems to me is proper to be drawn from this, is that, when a diagnosis of chronic cholecystitis is made in a comparatively young person, there should be a good deal of suspicion and hesitation in acting on that diagnosis. In younger people more care should be taken in the use of all diagnostic facilities than in older people, before subjecting the patient to an operation. The inference should not be drawn from this remark that young people deserve more consideration than older people, but we should remember that a diagnosis of cholecystitis with or without stones is less liable to be correct in the decade between twenty and forty than in the other decades.

In the cases that were operated upon with a diagnosis of gallbladder stones associated with cholecyctitis, in which roentgen examinations were recorded, half were so positive from the history that a clinical diagnosis should have been very safe and the other half were more or less indefinite, so that the roentgen examination was of value in confirming the diagnosis. We have the habit of operating on all gallbladder cases in which stones are present. It has not been long since I operated upon a patient who had a practically normal gallbladder wall. She had a few stones, but they were discovered by a roentgenogram in the hands of a diagnostician. This woman was sick, and I believe the gallstones were causing no trouble but all her illness depended on chronic pyelitis.

I also recall several cases that I have operated upon, in which there was a good deal of pain. I made a diagnosis of cholecystitis with stones, and at the time of the operation, following roentgen confirmation, found the stones and cholecystitis, but also discovered that the symptoms depended chiefly on either an ulcer in the prepyloric region of the stomach or an ulcer in the duodenum. One case that I remember with a good deal of chagrin was a young man who, at the hands of another surgeon, had had roentgen examination made with diagnosis of stones in the gallbladder, in whom there was a large ulcer on the less curvature of the stomach and no stones or cholecystitis. The majority of the cases that were operated upon, in which stones were found and a correct doagnosis had been previously made, depended on clinical symptoms, though there were seven cases operated upon for cholecystitis with stones, in which the stones were found and the roentgen examination had been negative.

SEVENTY-FIVE CONSECUTIVE BILIARY SURGICAL CASES *

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This series of seventy-five consecutive surgical cases is taken from the author's private practice since 1921 and should be fairly representative of what any other surgeon might meet with in his practice. The patients ranged in age from 17 to 78 years. There were twenty-two males and fifty-three females. Thirty-six showed chronic cholecystitis without stones, while thirty-nine showed chronic cholecystitis with stones either in gallbladder or in ducts. There were nine patients with stones in the common duct, two of whom had had their gallbladders removed several years previously by other surgeons. One of these had a stricture of the hepatic duct, associated with chronic cholangitis and jaundice with multiple stones. There were seven cases which were operated on during the acute attack, two of which had an empyema of the gallbladder associated with a secondary adjacent abscess. Sixty-seven of these cases had their gallbladders removed at the original operation, and eight had drainage done, but two of the latter had their gallbladders removed at a secondary operation.

The most common preoperative complication was chronic myocarditis. There was one extreme diabetic and one severe Addison's disease. Practically all cases were operated on under nitrous oxide anesthesia with the addition of a small amount of ether. The average amount of drainage used was two

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small cigarette-drains with one small rubber catheter, which was removed generally by the third day. Postoperatively, there were only four severe respiratory conditions, two of which antedated the operation, but none was fatal. There were three postoperative hernias to repair. Of two severe acute nephritic complications, both were in very fat women with stones, one of whom had several large stones in the common duct. There were two cases of phlebitis of the veins of the leg, and two probable cases of embolism, one of which caused death.

In this series of seventy-five cases, including the common duct cases, there were two deaths, or a mortality of 2⅔ per cent. One of these was a case of embolism following common duct surgery, and the other an old lady of 78 years of age, with an acute empyema of the gallbladder and a secondary adjacent abscess, as well as being an extreme diabetic.

The low operative mortality was due to the careful preoperative study and treatment by an experienced internist, and the careful selection of the safest time for surgical interference in the bad-risk patients. The author believes there are less postoperative complications in biliary surgery, when done during the quiescent period between attacks. This should be the time of choice for operative interference, except in cases of extreme emergency. Gas anesthesia in the hands of an expert has not been the cause of any serious postoperative complications or deaths. In the surgery the principle of doing as much as possible to prevent shock and using supportive treatment during operation and immediately following have no doubt been among the main factors to decrease the mortality. Practically no cathartics, pre- or postoperatively, were used. Extreme vomiting and distention were very rare in this series.

The records show that a large percentage of the poor results obtained in this series were cases referred by the attending physicians for gallbladder surgery, and were not observed for any length of time preoperatively by the author to determine the advisability of surgery. He feels, therefore, that except in cases demanding immediate surgery, proper time should be taken for observation and careful diagnosis in all doubtful cases.

In analyzing this series of cases, there are two problems which present themselves for study. First, what are the factors in diagnosis which determine the advisability of surgery; second, what are the end-results, and what relation do they bear to the history, physical and roentgen-ray findings before operation, and to the gross pathologic findings after operation.

In attempting to determine the end-results, a personal letter was sent to each patient, containing a questionnaire of some ten questions to be filled out and returned. When this failed to get a reply, either the author or the family physician personally interviewed the individual to ascertain the result obtained by surgery. By careful checking the author was able to obtain data on all cases. There have been four deaths since the gallbladder surgery, one dying following operation for ulcer of the stomach, one from hemorrhage of the stomach, one from Addison's disease, and in the fourth the author was unable to learn the cause of death. According to information received, two of these cases had been cured of their gallbladder trouble and the other two had been markedly improved prior to their deaths.

In tabulating the findings, the cases are divided into two tables, one with stones and one without stones (tables 1 and 2). In these tables an estimate of the history and physical findings combined in their relationship to diagnosis are given. These have been included together for they represent what the physician is able to learn from the patient. This estimate is marked as Group I, II or III which interpreted means that, if the history and physical findings are slightly suggestive of diagnosis, they are in group I, moderately diagnostic in group II, and definitely diagnostic in group III (table 3).

Next follows an estimate of the roentgen-ray findings, using the same system of three groups. Fifty-four of the seventy-five cases had a roentgen-ray study by Dr. C. J. Johannesson, twenty-seven of which had a complete study of the digestive tract with barium meal only, while twenty-seven had the combined study correlating the tetraiodide dye with the barium meal. Cases without the dye, group I, means that there were no indirect or reflex signs; group II means there was presence of indirect signs (as pressure indentation on duodenum and reflex disturbances); group III means that gallstones were visualized. In those cases where the barium meal was used in conjunction with the dye study, group I contains those cases, where the findings were only slight and there was fairly good concentration and visualization of the gallbladder at twelve hour study; no further concentration at sixteen hours; responded somewhat to the ingestion of fatty-meal; no indirect or secondary signs. Group II contains those cases, where there was lack of proper concentration and visualization at twelve

TABLE 1

THIRTY-NINE CASES WITH STONES

Hospital No.	History, phys. exam.	R'ntgen-ray	Gross pathology	End-results
M. B. 2038—G	III	....	III	III
E. B. 1015—G	III	....	III*	III
M. M. 1190—G	III	III†	III	III
J. F. 2060—G	III	III†	III	III
E. S. 2074—G	III	III†	III	III
J. P. 2215—G	III	III†	III	II
J. H. 2487—G	III	....	III	III
L. B. 2512—G	III	....	III	III
W. W. 9404—St. M.	III	III†	III	III
E. W. 8209—St. M.	III	....	III	III
V. W. 17472—St. M.	III	III	III	III
W. C. 9095—St. M.	III	III	III	III
S. G. 9091—St. M.	III	III†	III*	I‡
J. M. 10097—St. M.	III	....	III	III
J. S. 8687—St. M.	III	III†	III	III
R. G. 5114—St. M.	III	III	III	III
A. C. 1725—St. M.	III	III	III	III
F. B. 4712—S.	III	III	III	III
M. T. 6621—S.	III	....	III	III
K. K. 4520—S.	III	III	III	III
N. V. 4434—S.	III	I	III	III
C. K. 5885—S.	III	III	III	III
G. W. 5001—S.	III	III	III	III
W. P. 5101—S.	III	III†	III	III
E. S. 5553—S.	III	III	III*	III
L. S. 5538—S.	III	I	III	III
M. D. 6276—S.	III	I†	III*	II
J. A. 6920—S.	III	....	III	I‡
W. S. 7062—S.	III	....	III	III
J. B. 7240—S.	III	....	III*	II
E. M. —— —WW.	III	....	III*	III
J. C. 1623—U.S. V.	III	....	III	III
J. L.—B.	III	....	III	II
J. H.—B.	III	III	III*	III
D. B.—B.	III	....	III*	III
A. A.—B.	III	III	III*	III
F. M.—B.	III	....	III	III
C. W.—B.	III	III†	III	III

*—Common duct stones present.
†—Tetraiodide salt orally.
‡—Death.

TABLE 1, A

THIRTY-NINE CASES WITH STONES

	Groups I	II	III
History and physical examination	....	....	39
Roentgen-ray	3	....	20
Gross pathology	....	....	39
End-results	2*	4	33

*—Death.

TABLE 2

THIRTY-SIX CASES WITHOUT STONES

Hospital No.	History, phys. exam.	R'ntgen-ray	Gross pathology	End-results
J. J. 742—G.	III	II	III	III
C. C. 399—G.	II	III†	I	II
C. W. 500—G.	III	III†	III	II
H. V. 169—G.	II	II†	I	III
E. J. 3322—G.	II	III†	I	II
B. C. 1023—G.	III	II†	III	III
G. B. 2128—G.	II	I	I	I
B. K. 2269—G.	II	II	I	II
F. M. 2272—G.	II	II†	I	III
E. B. 2360—G.	III	II†	I	II
E. B. 3748½—G.	II	II†	III	III
T. P. 10699—St. M.	III	II†	III	III
G. B. 7993—St. M.	II	I	I	I
C. C. 6035—St. M.	III	III	II	III
E. J. 7754—St. M.	III	III	III	III
L. H. 7619—St. M.	III	III†	III	III
F. S. 17448—St. M.	III	II†	III	III
P. W. 1239—St. M.	III	....	I	I
L. C. 5562—S.	III	....	II	III
E. J. 4473—S.	II	II	II	I
A. L. 5246—S.	II	II	I	I
W. N. 4774—S.	III	III	III	II
E. R. 4394—S.	II	III	III	II
M. R. 5358—S.	II	III	II	I
A. W. 5444—S.	III	III†	III	III
P. P. 6135—S.	II	I†	II	I
J. F. 5565—S.	III	II	III	III
G. B. 6379—S.	III	III†	III	III
W. S. 5700—S.	III	....	I	III
H. S. 6047—S.	III	III†	I	I
G. J. 6456—S.	III	....	III	II
J. H. 6466—S.	III	....	III	II
A. B. 6832—S.	III	III†	III	II
F. M. 1990—U.S. V.	III	II	II	III
A. B.—B.	II	II†	I	I
R. V.—B.	III	III	II	II

*—Common duct stones present.
†—Tetraiodide salt orally.

TABLE 2, A

THIRTY-SIX CASES WITHOUT STONES

	Groups I	II	III
History and physical examination	....	14	22
Roentgen-ray	3	14	14
Gross pathology	13	7	16
End-results	9	11	16

TABLE 3

AUTHOR'S CLASSIFICATION

	Group I	Group II	Group III
History and physical examination	Slightly suggestive of diagnosis.	Moderate diagnostic.	Definite diagnostic.
Roentgen-ray	Fairly good concentration of gallbladder to dye; slight response to fat-meal; no "indirect" or reflex disturbances.	Lack of proper concentration and no response to fatty-meal. Positive "indirect" signs and dysfunctions of duodenum.	Stones visualized; no or practically no gallbladder shadow seen; severe reflex disturbances of stomach and duodenum.
Gross pathology	Nothing definite.	Slight thickening of gallbladder; adhesions or enlarged glands present.	Stones in gallbladder or common bile duct; fibrous changes; dense adhesions.
End-results	None or slight improvement.	50 per cent or more relieved.	90 per cent or more relieved

and sixteen hour study; no contraction of gallbladder after ingestion of fatty-meal; presence of reflex disturbances and dysfunction of duodenum (as intermittent regurgitation, pressure indentation, etc.). Group III contains those cases, where there was no or practically no concentration power and visualization of gallbladder shadow; severe reflex disturbances of the duodenum; calculi visualized either in gallbladder or ducts (table 3).

The gross pathology is listed according to the same three groups and the data are taken from the gross pathologic findings noted at the time of operation. Group I contains those cases where there is very little to be made out in the gross examination of the gallbladder to assure one of the presence of real pathology. Group II shows some definite gross pathology, such as thickening of the gallbladder, adhesions or enlarged glands along the ducts. Cases in group III showed marked pathology, such as dense fibrous changes in the gallbladder wall or adhesions, with or without stones. Microscopic study was not included for two reasons. In the first place, there was no dependable microscopic study made and, in the second place, the author does not believe a microscopic study is of additonal value in determining the advisability of operation, though he does feel that modern cultural methods of the glands and gallbladder wall are of value in postoperative study.

The end-results are also tabulated in three groups. Group I includes the unimproved or slightly improved cases which for practical purposes, we will say, did not get sufficient relief to repay the inconvenience of operation; group II includes those cases which obtained 50 per cent or more relief; group III includes those which had 90 per cent or more relief from symptoms.

In reviewing the records of the thirty-nine cases with stones, it is noted that there is little question as to diagnosis, for all gave either a definite diagnostic history or showed characteristic physical findings or both. Twenty-three of this series had roentgen-ray study made, thirteen having the barium meal without the dye and ten with the tetraiodide salt. All except three gave group II findings. These three cases were group I, one of which had had the gallbladder removed previously. Another had a decompensated heart with extreme congestion of the liver, and the third gave a definite history and showed marked pathology with stones, while the barium meal study was practically negative. Thirty-three of the thirty-nine cases were cured, four much improved and two deaths (table 1, A).

When we turn to the second series without stones (table 2), we find a much more difficult task in making the diagnosis and determining the advisability of surgery; and the end-results do not average up as favorably as in the stone-series. Twenty-two of these thirty-six cases gave histories and physical findings of group III, fourteen of group II. Thirty-one cases had roentgen-ray study, seventeen with the barium meal and dye, fourteen with barium meal only. The roentgen-ray findings showed fourteen cases in group III, fourteen in group II, and three in group I. Sixteen showed group III pathology, seven group II, and thirteen group I. As regards end-results, sixteen were marked group III, eleven group II, and nine group I, making 75 per cent of this second series cured or markedly improved (table 2, A).

Of the twenty-two who gave typical histories or had marked physical findings, twenty were listed under end-results in group II or III. One case only, slightly improved, was an early case and was only drained, but should have had a cholecystectomy; the other case was unimproved and still has exactly the same typical complaint and history. She was a young woman and the roentgen-ray findings with the dye were of group III, but the pathology was of group I. This case either had a mistaken diagnosis or else biliary duct trouble was overlooked at time of operation, which was four years ago.

Of the fourteen cases where the history and physical findings were in group II, there were three cured, four markedly improved and seven only slightly. Of the three cases cured all showed a group II reaction to the dye, two showed only slight and one marked pathology. Of the four markedly improved cases, two had group III findings with the dye and barium meal study, while the other two were of group II. Three of these cases had only slight pathology, and one marked. Of the seven cases which were only slightly improved, roentgen-ray and pathologic findings were either in group I or II (table 4).

It is worth noting, that of three cases in this series with group I roentgen-ray findings, none were much improved by operation. Of the thirteen of group I pathology, seven were much improved or cured, while six were not (table 5).

CONCLUSIONS

In summarizing the results of the analysis of the seventy-five cases, the following conclusions may be deducted.

1. Gallstone surgery is much more satisfactory than that of cholecystitis without stones, even though the mortality may be higher in the former.

TABLE 4

Analysis of the Nine Slightly Improved (Group I) Cases from Table 2

	Groups I	II	III
History and physical examination	1	7	1
Roentgen-ray	3	3	2
Gross pathology	6	3	....
End-results	9	....	....

TABLE 5

Results Obtained in the Thirteen Cases with Group I Pathology from Table 2

	Groups I	II	III
End-result	6	4	3

The stone-cases are either greatly improved or die, provided adequate surgery is performed.

2. It requires much more experience, observation and gross pathologic knowledge to determine the advisability of surgery in simple chronic cholecystitis. It is very important that the surgeon personally make a careful analysis of the doubtful cases and keep them under observation, because they seldom come under the class of urgent surgery. Some of these cases were kept under observation for months or even years before operation was performed.

3. Cases of slight pathology of the gallbladder present a problem hard to solve at the operating table, even when you have a careful history and physical examination in mind, as well as a roentgen-ray study. Wide experience and knowledge of living pathology is of utmost importance.

4. The carefully taken history and thorough physical examination stand first in determining the advisability of operation.

5. The roentgen-ray studies with tetraiodide salt and barium meal are of great aid in determining the advisability of operation in many cases, particularly when there is no characteristic stone-history, and should be used in all cases where possible.

Ringworm of Feet. William L. Gould, Albany, N. Y. (*Journal A.M.A.*, April 18, 1931), emphasizes the importance of foot baths containing from 10 to 15 per cent sodium thiosulphate in the treatment of ringworm of the foot. If the foot was not entirely immersed in the solution the results would not be so successful, because all the parts of harboring the organisms would not be reached. Swabbing is usually done on the more apparent areas and not the more obscure, where the tinea may be just as plentiful as a constant source of reinfection. It undoubtedly is frequently not so much the medicament that fails as it is the mode of its application. The bath is unhandy at times, however, and a 20 per cent powder of sodium thiosulphate in boric acid has been tried with success on feet, footwear and floors. The powder is more easily applicable and as with the bath may readily be placed on the entire foot, especially between the toes, about the nails and beneath the soles.

EXPERIENCE WITH SODIUM AMYTAL *

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Our experience with sodium amytal began in July, 1929. Up to the present time it has been administered in the clinic to 305 patients. It has been a new drug on trial, and we have been careful in recording our observations and rather critical in analyzing them. From this study we are beginning to realize some of its advantages and are learning to depend on its use for certain types of cases. We have also learned to appreciate that there are certain contraindications, or rather certain classes of cases wherein it has no added advantage.

HISTORY

Sodium amytal is sodium isoamylethyl barbiturate, that is, a sodium salt of amytal, which is a member of the barbituric acid series. It differs from the hypnotic tablets which have been used for years essentially in the fact that it is a soluble salt, and hence can be administered in doses large enough to produce unconsciousness immediately. That is, it is sure, dependable and rapid acting.

Fredet, in France in 1924, was the first to report the induction of general anesthesia by the intravenous administration of a barbituric derivative. He used somnifene. Bumm, in Germany in 1927, used pernokton. Meanwhile Page and Swanson showed amytal to be the most effective and least toxic of the barbituric acid series. Coryllos, Chambers and others used the drug extensively as an anesthetic in animal experimentation, and finally in February of last year Zerfas and McCallum, of the Indianapolis City Hospital, reported the successful induction with sodium amytal of general anesthesia in man in about 300 cases. Subsequently Lundy, of the Mayo Foundation, reported the use of his drug in a large series of cases, and at the present time many clinics as well as private practitioners are using the drug in an experimental trial.

PREPARATION AND ADMINISTRATION

We have received from the manufacturer sodium amytal in crystal form, put up in ampules of ½ gram, 1 gram, and 1½ gram. With each ampule we have received an accompanying ampule of triple-distilled sterile water, which when added to the anhydrous salt makes a 10 per cent solution. The accompanying sterile ampule of water is added to the salt and the mixture is shaken gently until it is dissolved. Ten minutes should be allowed for the solution to reach the proper hydrogen ion concentration. A few times the solution obtained has not been clear, and this has been immediately discarded for another. We have given it only intravenously and at the rate of a grain and a half a minute. All of our patients have had a preliminary medication of 1/6 to ¼ grain of morphine sulphate and 1/150 grain of atropine sulphate one hour before the administration of the sodium isoamylethyl barbiturate. Practically all of the patients have had the administration of the drug in the room.

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* From the Mason Clinic.

* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

The usual precautions that are taken with general anesthetics of any kind should be taken with this drug. We feel that for surgical preparation the intravenous route of administration affords the best method of controlling the dosage.*

DOSAGE

There can be no rule-of-thumb statement of dosage. There is a wide variation in individual susceptibility to the drug, just as with all hypnotics. This, to us, seems of greater importance than the weight of the patient in determining the amount the individual should receive. This susceptibility can best be judged, as in giving inhalation anesethetics, by the color, blood pressure, pulse and respiration as the drug is administered. Age and general strength are important considerations. Very old or debilitated patients may fall fast asleep after 3 to 4 grains have been given, while young, robust patients require 7 to 9 grains before they lose consciousness. Several have required as much as 17 grains to secure sleep. While at first we gave larger doses, we now stop short as soon as the patient loses consciousness.

At first we tried to produce surgical relaxation with additional drug after the patient fell asleep, but we now use the drug only as a *preanesthetic* and hence in the smaller dosage, i.e., barely enough to dull the sensorium or erase consciousness, usually 3 to 9 grains. In other words, at the present time we do not advise any more than a hypnotic dose, which takes out of the general anesthesia that excitement stage. However, we did not find the larger doses dangerous to the patient.

GENERAL EFFECT

By using a very small hypodermic needle attached to a 10 cc. syringe, the induction of sleep is not at all unpleasant. During the intravenous administration of the first 3 to 9 grains the patient may remark that he feels sleepy, and if engaged in conversation he will begin to slur his words and finally he drops off into a quiet sleep in the middle of a sentence.

The blood pressure falls 15 to 30 mm. of mercury, as a rule. But this fall is transient and the normal blood pressure will be restored within fifteen minutes, or after the first squirming or motion on the part of the patient. The pulse rate is usually increased, although it may be reduced if previously elevated above the normal by excitement. The respirations are reduced in rate and amplitude. The color remains good. A few cases of initial cyanosis were attributed to too large a dose of morphine given too close to the administration of the drug. The pupils become contracted and in some cases fixed so they will not react to light. This is of practical significance, since one of the anesthetist's guides to the depth of anesthesia is thus removed.

ADVANTAGES

Patient's attitude. The reason we have continued the use of sodium amytal is because of the gratitude expressed by the patients who have received it. The most enthusiastic group are those who have had general anesthetics at some previous time. The ordeal of having to get onto an uncomfortable ward carriage, go to the elevator, be transferred to the surgical floor, and then from the ward carriage to the operating table is more trying than those imagine who have not been through it. To get a glimpse of the operating room, nurses and doctors all in white, and often to see and hear the rattle of the instruments as they are being transferred from one basin to another, and then to cap the climax to have something tight dropped over the mouth and nose—to be relieved of all this is most gratifying. These patients state that instead of experiencing the most uncomfortable day of their lives, the day is passed without their knowledge, and when they awake late in the afternoon they find that the operation has been performed and they are safely back in their beds. Many of these patients, when told that the operation has been performed and that they are again back in their own rooms, are so much relieved that they drop off to sleep again for two or three hours.

We have made it a practice to talk to these patients and to get their points of view, and it is because of their enthusiasm and because we feel we have relieved them of a great amount of wear that we are more than willing to undergo the inconvenience that surrounds the administration of the drug. The necessity of having a special nurse for these patients, the occasional delay by the intern who administers the drug in the room, and the occasional delay in obtaining supplementary anesthesia (because the shallow respirations slow the inhalation of the general anesthetic) are rather annoying to the busy surgeon who has been accustomed to the old regime, but we feel the relief and satisfaction that the patient derives far outweigh these minor difficulties.

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*See supplementary statement at end of paper.

For a long time this result has been attempted with various agents, scopolamine being outstanding. Sodium amytal has the advantage that it is *sure* in the accomplishment of the result desired, and at the same time more exact in the degree of stupor or unconsciousness that it produces. The effect is reached immediately upon injection, if the sodium barbiturate is given intravenously; and by observation of the patient's reaction to it as the drug is administered he can with safety be carried to any of three states as desired, i.e., cooperative stupor, deeper unruly stupor or total unconsciousness. We believe that it should not be used to carry the patient beyond this third stage to secure relaxation. It is not an anesthetic.

Another great advantage of the sodium barbiturate is the almost total elimination of postoperative nausea and vomiting. The absence of an excitement stage in the induction of general anesthesia is an added advantage, particularly in goiter patients with bad hearts.

COMPLICATIONS

Two untoward effects may be seen. On the one hand, the patient may react in a restless stupor and require constant nursing attention for control, or, on the other hand, he may lie listless long enough to favor passive congestion, particularly of the lungs, since the respirations become so shallow. The restless reaction occurs more frequently where large doses of the drug have been given, and particularly in robust people accustomed to alcohol. The condition is relieved by reassuring the patient, administering morphine early, and catheterizing the bladder which in some patients becomes too relaxed to empty itself.

The other reaction mentioned occurs in susceptible subjects, particularly the aged, also following too large a dose. The patient lies motionless for twelve to thirty-six hours and, with the shallow respirations as an additional hindrance to pulmonary circulation, he may develop pulmonary congestion. We had three definite cases of pulmonary congestion and one was followed rapidly by frank pneumonia and death. The other two recovered. Because of this loss of tone and tendency to congestion in a small percentage of cases, we now administer 5 per cent carbondioxide and 95 per cent oxygen to all cases before they are moved from the operating table and then repeat this several times in the bedroom of the patient who tends to lie too quietly. We also give caffeine and ephedrine as a circulatory tonic in these cases.

CONTRAINDICATIONS

We feel that debilitated or elderly people should not have sodium amytal, nor should patients with respiratory obstruction. Patients with a very high or very low blood pressure, being poor risks, should not be subjected to an additonal drug. We are not so certain that the very small hypnotic dose that we are using at the present time would be contraindicated in pulmonary infection; however, we have not given it to any patients with a cough preceding the operation. In practically any case, where there was some particular indication because of extreme nervousness on account of the impending operation, we should be inclined to advise a hypnotic dose because there is very little reaction to a small dose except to throw the patient into a very quiet, peaceful sleep.

CONCLUSIONS

Sodium isoamylethyl barbiturate used as a *preanesthetic* with a dose just large enough to make the patient lose consciousness, has given us more satisfaction than any other drug we have used. In patient's with Graves' disease and in those who are nervous, sensitive or apprehensive it gives the most satisfying results. If given slowly and intravenously, and the dose stopped as soon as the patient loses consciousness, we do not believe one will ever experience any serious untoward effects.

COMMENT

1. Sodium amytal is a *preliminary* anesthetic rather than an anesthetic.

2. It contributes to surgical management a dependable and rapidly acting hypnotic, and for this purpose is preferable to scopolamine and other drugs heretofore used.

3. The solution should be clear.

4. We prefer to give it by vein (a) to more accurately gauge susceptibility, and (b) to more accurately control the degree of hypnosis.

5. A meager hypnotic dose has proven more sat-

isfactory than large dosage in our hands. This varies according to susceptibility from 3 to 9 grains.

6. There are two chief complications: (a) The restless reaction, and (b) loss of circulatory tone, with pulmonary congestion.

7. The chief contraindication is advanced age.

During the ten months since this paper was read we have continued the use of sodium amytal in preparing the large majority of our patients for operation, but we have substituted oral administration for the intravenous route. As an average routine, we now give the patient one three-grain capsule at eight o'clock the evening before operation, another as soon as he awakens in the morning, and two more capsules an hour-and-a-half before the operation. In addition, morphine is given forty-five minutes before operation. With this preliminary medication the patient is asleep when taken to the surgery, yet he can be easily aroused and will respond to questions, although he drops off to sleep again when left undisturbed. Ninety per cent of patients with this dosage so administered will reach this desirable level of hypnosis by the time the stretcher arrives to take them to the operating room. The other ten per cent may require still another three-grain capsule a half hour before operation to secure sleep. Patients with toxic goiter and those with very apprehensive minds constitute this ten per cent, and to these we give the additional capsule, if they are not asleep a half hour before scheduled for operation.

As described above, in our experience in giving the drug intravenously this individual variation in susceptibility can be more accurately recognized than when it is administered orally. However, by observing the patient at the intervals stated and giving the additional capsules only as found necessary, the desirable level of hypnosis can be reached with fair success in almost all instances. The chief reason we have forsaken the intravenous administration is the inconvenience of it. One house doctor must give up much of his time for it, some patients' veins are difficult to enter, and last minute delays in getting the patient to the operating room occur and confuse the operating schedule.

For the past eight months, with the exception of a few cases, we have employed the oral route of administration. During this time we have come to prefer this method, not only for its greater convenience, but also because the result obtained is very satisfactory. The patient after such medication takes the inhalation anesthetic well or cooperates splendidly for a local anesthetic. The thyroidectomy patient can be aroused at the end of the operation, and in those left alone after operation the reaction time from an ether anesthetic is not prolonged more than an hour over that where this hypnotic has not been given. And still in most cases the patient does not remember the trip to the operating room, despite the fact that he was able to move by himself from the stretcher to the operating table when told to do so. The shortened period of hypnosis, which permits the patient to awaken from the anesthetic at aproximately the usual time rather than after a period of four or five hours, should, theoretically at least, lessen the postoperative incidence of passive congestion and atelectasis of the lung, complications found occasionally with larger doses of sodium amytal intravenously. With this amount of the drug absorbed more slowly from the alimentary tract, we have seen no undesirable reactions, neither of the restless nor the atonic type.

We believe that the intravenous method of administering the drug is still to be preferred in certain medical conditions, such as cases of severe colic, convulsions, maniacal conditions, etc. In such instances we follow the experience described above in determining dosage and susceptibility.

THE CLINICAL USE OF SODIUM AMYTAL

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Within the past decade some of the more recently developed barbituric acid compounds have found much favor as the result of laboratory and clinical investigation. So much has been published and in so much detail that it is difficult for the busy physician to avail himself of all these data. For this reason we are eliminating most of the detail and limiting ourselves to a large degree to the practical use of sodium amytal in medicine, surgery and obstetrics.

In 1923 Shonle and Moment[1] reported the preparation isoamylethyl barbituric acid, and the same year Page[2] used it experimentally in the laboratory.

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1. Shonle, H. A., and Moment, A.: Some New Hypnotics of the Barbituric Acid Series. Jour. Amer. Chem. Soc., xiv, 243-249, 1923.

2. Page, I. H.: Isoamylethyl Barbituric Acid; an Anesthetic Without Influence on Blood Sugar Regulation. Jour. Lab. and Clin. Med., ix, 194-196, 1923.

Page and Coryllos,[3] in 1926, prepared the sodium salt of this acid.

INTRAVENOUS USE

In surgery. In 1929 Zerfos[4] and others used sodium isoamylethyl barbiturate intravenously in man and concluded that it was not entirely satisfactory because the drug had a tendency to deteriorate on standing, and because strictly uniform solutions were difficult to prepare. More recently, however, the sodium salt has been purified so that it may be given intravenously with relative safety. A prolonged period of sleep followed its use in doses of 1.5 grams in the average size patient. Half this dose was found adequate for minor operations prior to the administration of ether, or nitrous oxide and oxygen, and usually reduced the amount of the latter necessary to use by 75 to 80 per cent. A similar dose preceding skin infiltration with procaine was found practical in poor surgical risks.

The injection should not exceed one cubic centimeter per minute. The patient goes to sleep rapidly; the blood pressure may fall 15 to 20 millimeters of mercury temporarily, but rapidly returns to normal. The patient may sleep from three to eighteen hours. Morphine sulphate, grains one-sixth to one-eighth, controls postoperative restlessness. Ephedrine sulphate, grains three-fourths intramuscularly and caffeine sodium benzoate ten to fifteen grains, causes more rapid convalescing.

In medicine. In medicine sodium amytal given intravenously in ten to fifteen grain doses was found adequate for the control of convulsions in eclampsia, strychnine poisoning, epilepsy, tetanus and rabies, as well as to be efficacious in the treatment of extremely nervous patients. The convulsions were controlled, as a rule, for from six to ten hours.

ORAL ADMINISTRATION

More recently, the oral administration of sodium amytal has had much clinical investigation in the field of medicine, obstetrics and surgery.

In medicine. Sodium amytal has been used as a sedative and hypnotic in many cases of extreme restlessness and insomnia in three to six grain doses oraly, with very satisfactory results.

In obstetrics. In October, 1930, Morehead and Mussey[6] reported on the oral use of small doses of sodium amytal for obstetric analgesia. The literature does not appear to give accurate information as to the time of administration and the oral dosage. They used the drug in various doses and at varied intervals during labor. They concluded that sodium amytal seemed to have a better sedative effect, if the first dose did not exceed three grains, and was not given until the cervix of the uterus was at least partially effaced, and dilated to at least two centimeters. The patients, in their series, rested or fell asleep between pains. Subsequent periodic rectal examinations showed partial relaxation of the anal sphincter and perineal muscles and usually rapid softening of the cervix. If considerable tonus returned to the muscles, a second dose of three grains was given orally with rapid return of relaxation of the muscles, and the cervix remained soft and pliable. More rapid absorption was obtained by giving the capsule with hot water.

1. Results in primiparae. One of the most outstanding results in the use of sodium amytal was the shortening of the first stage of labor. This stage was completed, in the average normal case in primiparae, within three hours from the time of administration of the drug. The shortest time recorded was forty minutes. In primiparae with occiput posterior positions, the average time was about six hours.

2. Results in multiparae. In multiparae, one-third of the cases had complete dilatation within an hour after the administration of the sodium amytal. The cases of abnormal presentation required more time. There were in all twenty cases of multiparae and twenty-six of primiparae in the series.

3. Conclusions. With the use of sodium amytal in obstetrics the first stage of labor is shortened and the mother can have considerable analgesia, while the head is moulding into the pelvis and the cervix is being dilated.

In surgery. Zurfas and McCallum[7] suggested that sodium amytal be used in comparatively small doses in combination with local and general anesthetics. In July, 1929, a preliminary report on the clinical use of this agent at the Mayo Clinic[8] showed that it was valuable in surgical cases, but it was best to use it in small doses, combined with inhalation anesthesia, in order to avoid unpleasant aftereffects, such as excitement and pulmonary complications.

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[3] Page, I. H., and Coryllos, Pol: Isoamylethyl Barbituric Acid (Amytal); Its Use as an Intravenous Anesthetic. Jour. Pharmacol. and Exper. Therap., xxvii, 189-200, 1926.

[4] Zerfas, L. G., McCallum, J. T. G., Shonle, H. A., Swanson, E. E., Scott, J. P., and Clowes, H. A.: Induction of Anesthesia in Man by Intravenous Injection of Sodium Isoamylethyl Barbiturate. Proc. Soc. Exper. Biol. and Med., xxvi, 399-403, 1929.

[5] Lundy, J. S., and Osterberg, A. E.: Review of the Literature on the Derivatives of Barbituric Acid; Chemistry; Pharmacology; Clinical Use. Supplement 2, Proceedings Staff Meetings of the Mayo Clinic, 386-410, Dec. 18, 1929.

[6] Morehead, D. E., and Mussey, R. D.: The Oral Use of Small Doses of Sodium Isoamylethyl Barbituric for Obstetrical Analgesia. Preliminary Report, Proceedings, Staff Meetings of the Mayo Clinic, 278-280, Oct. 1, 1930.

[7] Zerfas, L. G., and McCallum, J. T. C.: Analgesic and Anesthetic Properties of Sodium Isoamylethyl Barbiturate. A Preliminary Report. Jour. Ind. Med. Assn., xxii, 47-50, 1929.

In 1929 we had occasion to observe the use of sodium amytal given orally in over two hundred cases of subtotal thyroidectomy. The drug was given in various doses and at varied intervals before operation. It was concluded that, for the average sized patient, six to nine grains should be given two hours before operation, supplemented with one-sixth of a grain of morphine sulphate and one-two hundredth of a grain of scopolamine twenty minutes before operation. It should be used as a hypnotic rather than as an anesthetic. The patients were made much more comfortable than when morphine alone was use.

Lundy[9] suggested giving three grains the night before operation. This was tried with good results; the patients had a good night's sleep and were in much better physical and mental condition to withstand surgery. They were brought to the operating room in wheel chairs, and the anxiety, which usually exists just before operation, was not noted in them. Those who had three grains of sodium amytal the night before operation seemed to be much more rested than those who did not. Most of them were drowsy and had to be assisted to the operating table. A few seemed quite alert; three were loquacious, but none were anxious or apprehensive. Some registered slight complaint because of pain when the first needle puncture was made in infiltrating the tissues of the neck. There seemed to be slight discomfort when the superior pole was clamped prior to ligation and also when the lobes were elevated. This was thought to be due to traction on the trachea.

All in all, the patients seemed to be much more comfortable than when sodium amytal had not been used preoperatively. At any time during the operation they could be aroused sufficiently to be made to respond to questioning; consequently, the danger of recurrent laryngeal nerve injury could be just as easily prevented as when nitrous oxide was used at the more trying stages of the operation from the patient's standpoint.

After operation there was no nausea or emesis; the patients all rested comfortably after being brought to their rooms, and morphine sulphate was not necessary for from eight to twelve hours after operation. Twenty-four hours later they did not recall any of the discomforts of the thyroidectomy. With nitrous oxide these discomforts are later often recalled as horrible experiences.

While it is difficult to determine a mortality rate in such a small series of cases as compared with the larger number operated upon without sodium amytal, there were no complications in this series that would have a tendency to raise it.

SUMMARY

Since 1923 rapid strides have been made in the preparation, purification and development of the barbituric acid compounds. Sodium isoamylethyl barbituric acid seems to have enjoyed the most widespread use.

Medically, sodium amytal has met favor by its intravenous use in controlling convulsions in eclampsia, strychnine poisoning, epilepsy and tetanus, and in controlling the symptoms in extremely nervous patients, as well as its oral administration in seasickness, nervousness and insomnia.

In the field of surgery sodium amytal has been used intravenously as an anesthetic and orally as a hypnotic in combination with inhalation anesthesia.

In obstetrics this preparation has been given orally with very gratifying results.

CONCLUSIONS

Of the barbituric acid compounds, sodium amytal seems to be the one that has met with the most favor. It has a distinct field in medicine, surgery and obstetrics, and may be given intravenously where rapid action is desired, or orally where this is not necessary.

Our most recent experience has been in connection with its use in the field of thyroid surgery, and we feel that here three grains the night before operation and six to nine grains two hours before surgery, given orally, supplemented with morphine sulphate grains one-sixth and scopolamine grains one-two hundredth twenty minutes before operation, is the advisable dosage, as well as the most satisfactory time of administration.

We feel that it should be used in combination with morphine and scopolamine, as stated, and local anesthesia. It should be used in thyroid surgery as a hypnotic rather than as an anesthetic.

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[8] Lundy, J. S.: The Barbiturates as Anesthetics, Hypnotics and Antispasmodics; Their Use in More Than 1,000 Surgical and Nonsurgical Cases and in Operations on Animals. Current Res. Anesth. and Anal., 360-365, 1929.

[9] Lundy, J. S.: Proceedings of the Staff Meetings of the Mayo Clinic, p. 279, Oct. 1, 1930.

SODIUM AMYTAL THERAPY

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Sodium amytal* (isoamylethyl barbituric acid) has been used for many years by different investigators as a general anesthetic for animal experimentation. It was first used intravenously in humans by Zerfas and McCollum[1] in 1928. Since that time it has been used not only intravenously but also orally and by rectum in a great variety of cases. Major operations have been performed under sodium amytal anesthesia, but the tendency at the present time is to give only enough to produce hypnosis and light anesthesia, and then supplement this light anesthesia with novocaine locally, or nitrous oxide gas or ether.

Some patients require more sodium amytal to give the same degree of anesthesia than do others of the same age and weight. The very elderly patients require less as a rule than those of middle age; those in good health require less than those in an exhausted condition, and those who are complacent require less than those who are nervous.

Zerfas and McCollum[2] state that 15 grains (1.0 gm.), when given intravenously, are sufficient to render the patient unconscious and to produce very light anesthesia. I have used from 10 to 15 grains, depending on the amount of anesthesia desired. The anesthetic action of sodium amytal is due to its action on the brain and cord, while the sensory and motor peripheral nerves remain intact.

Sodium amytal should not be given more rapidly than one and one-half grains per minute. Anesthesia comes on rapidly and without disagreeable sensations. Frequently the patient is asleep before he is aware of it. In most cases the blood pressure drops from 10 to 20 millimeters, and the pulse increases slightly; therefore, patients with marked hypotension and weak cardiovascular systems are not good risks. There may be fixation of the pupils; in one case I noticed their inequality.

With any new anesthetic one is especially interested in contraindications and disadvantages. Patients with an idiosyncrasy to any of the barbiturates should not be given sodium amytal. A certain number become quite restless and some even delirious and almost unmanageable after sodium amytal anesthesia, and, of course, require more nursing care. One must watch that the patient's tongue does not fall back in his throat and cause strangulation. Edema of the lungs may result from the patient lying on his back too long, following sodium amytal anesthesia. The only undesirable effect that I have observed from its intravenous administration was a mild chemical phlebitis at the point of venipuncture.

After considering its disadvantages, we may now turn to its advantages. The greatest that I have observed is the absence of postoperative nausea and vomiting. It also takes away that terrible fear of surgery and the anesthetic by allowing the patient to fall asleep before going into the operating room. He does not struggle during induction of anesthesia and his breathing is quiet, an obvious advantage in abdominal surgery. He is unconscious from two to four hours, and will sleep from eight to thirty-six hours. He may be awakened during this time, however, and given fluids. This sleep lessens the amount of morphine and other sedatives usually needed.

Since sodium amytal does not raise the blood sugar as high as does ether, it is really preferable as an anesthesia in the surgery of diabetics.

So far as is known, it does not have any undesirable effect on body chemistry. Mason[3] showed that repeated urinalyses after administration of the drug gave no albumin, casts or erythrocytes. The average blood urea and creatinin immediately after and twenty-four hours after the operation, under combined sodium amytal and ether anesthesia, showed a slight increase over the fasting level before operation. The average blood sugar showed an average increase of 26 milligrams per 100 cc. over the fasting level before the operation, and an average increase of 27 milligrams per 100 cc. twenty-four hours after the sodium amytal had been administered. There were no changes in the hemoglobin nor the red cell counts.

I have used sodium amytal intravenously in twenty-five cases and orally in fourteen. Of this number twenty-two have been surgical, eleven obstetric and six medical. Out of these thirty-nine cases, delirium and marked restlessness were observed in three. These were easily quieted by a hypodermic of morphine. Three had some incoherence of thought after awakening, and one had a certain amount of amnesia for about three days. The others slept quietly for eight to twelve hours and required much less morphia than those without this hypnotic. One patient, aged 67, who had had twelve grains of sodium amytal orally two hours before taken to the surgery for a subtotal lobectomy, slept nearly eighteen hours. During this time it was not necessary to give her any morphine. She also had less trouble in swallowing than is usually evidenced in these cases.

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* The sodium amytal for this work was supplied by Eli Lilly and Company.

[1] Zerfas, L. G. and McCollum, J. T. C.: Analgesic and Anesthetic Properties of Sodium Isoamylethyl Barbiturate; Preliminary Report. Jour. Ind. State Med. Assn., xxii, 47-50, Feb., 1929.

[2] Ibid: Clinical Use of Sodium Isoamylethyl Barbiturate. Anesthesia and Analgesia, viii, 349, Nov.-Dec., 1929.

[3] Mason, J. T. and Baker, J. W.: Experience with Sodium Amytal as Intravenous Anesthetic. S., G. and O., l, 828, May, 1930.

The following are case syponses of some of the records of patients given sodium amytal:

SURGICAL

Case 1. Mrs. M., age 52. Closure of colostomy. Eight grains of sodium amytal were used intravenously, supplemented by novocaine locally. Good anesthesia and relaxation until closure of tension sutures in fascia necessitated more relaxation which was obtained by a very small amount of ether. Patient had complete bowel obstruction six weeks previously, at which time a colostomy was done. Two weeks later a carcinoma of the descending colon was resected and a lateral anastomosis made. After closure of colostomy the patient was not nauseated and recovered.

Case 2. Mr. B., age 70. Prostatectomy, second stage. Ten grains of sodium amytal by vein supplemented by some ethyl chloride during actual enucleation. There was good anesthesia and a good recovery. Patient was drowsy for several hours after operation.

Case 3. Mrs. W., age 65. Fractured cervical neck of left femur and neck of left humerus. Eleven grains of sodium amytal by vein gave apparent surgical anesthesia because the reduction of the fractured femur and application of body cast caused no pain. No gas nor ether was needed. There was no nausea. The patient later died of acute dilatation of the stomach.

Case 4. Miss W., age 21. Resection of hematocyst of right ovary. Ten grains of sodium amytal and one-fourth can of one-quarter pound of ether were used. There was very slight shock to the operation. No nausea nor vomiting. Excellent recovery.

Case 5. Mrs. F., age 41. Appendectomy. Eleven grains of sodium amytal were given by vein, preceded by one-fourth grain morphine and one-hundred-fiftieth grain atropine. Six ounces of ether were used. Good recovery with very few gas pains.

Case 6. Miss C., age 13. Adenoids and tonsils removed. Six grains of sodium amytal were given orally supplemented with about one-half the usual amount of ether. No post-operative nausea nor vomiting.

Case 7. Mrs. R., age 67. Strangulated femoral hernia. Ten grains of sodium amytal were used intravenously, supplemented with local anesthesia of novocaine. Good relaxation. No vomiting. Very satisfactory results.

Case 8. Mrs. T., age 67. Toxic adenoma. Subtotal lobectomy. Auricular fibrillation. Twelve grains of sodium amytal were given orally, supplemented with local infiltration of one-half per cent of novocaine. Patient slept about eighteen hours, only awakening enough to take fluid. No hypodermic necessary for fourteen hours. No emesis. Excellent recovery.

Case 9. Mr. W., age 48. Cystoscopy. Nine grains of sodium amytal were given orally; asleep in about thirty minutes. One-fourth grain of morphine was given in addition. Diagnosis of papillary carcinoma. Patient lay very quiet during routine procedure and complained of no pain. Slept about four hours.

OBSTETRIC

Case 10. Mrs. S., age 30, multipara. When the cervix was about two fingers dilated, pains were very severe and every three or four minutes. Twelve grains of sodium amytal intravenously gave sound sleep for one and a half hours with no cessation of pains, and amnesia and rest between pains for an additional four hours. Pains unchanged in frequency and quality. Ether given during second stage.

Case 11. Mrs. I., age 29, primipara. Ten and one-half grains of sodium amytal were given by vein when cervix had two fingers dilatation and pains were every four to five minutes. Patient was quite nervous and could not stand pain well. Sodium amytal gave good hypnosis and amnesia so that she did not know when she entered delivery room or when she left it. Less ether required during second stage.

Case 12. Mrs. O., age 23, primipara. The patient had only been in labor for two hours when her pains were every three to four minutes in frequency, and the cervix two fingers dilated. Twelve grains of sodium amytal intravenously gave hypnosis and sleep between pains for three and one-half hours. After this six grains of sodium amytal were given orally because the patient was not ready to deliver and was complaining some. However, after the delivery she only remembered having had pains for two hours during the eight hours and forty-five minutes of labor.

Case 13. Mrs. D., age 35. Multipara. Six grains of sodium amytal were given orally one hour after pains began because they were severe and every five to six minutes. In thirty minutes there was considerable hypnosis, and the patient was sleeping between uterine contractions which were not diminished in frequency or quality. Six grains were repeated in one and one-half hours, and she delivered, having had very little ether. She remembered having had but one hour of labor pains, and said they hardly seemed real.

MEDICAL

Case 14. Master S., age 4. Acute encephalitis. The patient had repeated convulsions which were poorly controlled by the usual hypnotics. Five grains of sodium amytal intravenously gave excellent hypnosis. This was repeated, and eight grains were given by rectum several times. The convulsions were controlled, and the child was quiet.

Case 15. Mrs. C., age 32. Asthma. The patient was very nervous and because of cough could not sleep. Three grains of sodium amytal by mouth gave good hypnosis when other hypnotics had failed.

Case 16. Mrs. H., age 52. Bronchogenic carcinoma. This patient had excruciating pain. Morphine would relieve the pain, but would not always produce sleep. Ten grains of sodium amytal by vein was used once and gave excellent results. It was used orally many times with equally good results.

Case 17. Mr. T., age 25. Bronchopneumonia. This patient was very delirious and unmanageable. The prognosis looked poor. Twelve grains of sodium amytal were given intravenously and the patient rested quietly. From this time on he seemed to improve, and recovered.

Case 18. Mr. S., age 35. Acute delirium following skull fracture. Six grains of sodium amytal orally would quiet the patient. This was repeated for three successive nights.

This report does not include enough cases to enable one to draw many conclusions, but it is given to show how useful the drug may be in general practice. I believe that it is especially valuable in obstetrics. I have used it both intravenously and orally, as the case reports show, and have found that the best and most prolonged action is obtained when it is given orally. Sometimes, however, labor pains may be so frequent and severe that it must be given by vein in order to be effective at the desired time.

The dose depends on the condition of the patient and the severity of the pains. At first I used morphine and magnesium sulphate as in the Gwathney technic and then gave ten to twelve grains of sodium amytal intravenously in place of the quinetheroil, when the cervix was dilated about two to three fingers. This caused the patient to sleep from three to five hours. At the end of this time she was ready for inhalation anesthesia.

It is well known that some obstetric patients suffer more during the early part of the first stage of labor than others do in the latter part; therefore, the dilatation of the cervix may not be the best guide for administering the sodium amytal. Since using the sodium amytal orally, I see no reason for giving morphine at all, as it slows the labor and may even stop it in the early stages.

Sodium amytal, when given intravenously in large doses, may inhibit the frequency and intensity of uterine contractions, but when given orally it does not. It may be given orally as early in the first stage as the patient complains of her pains. In doses of six grains no particular effect will be noticed except that the patient becomes quiet and sleeps between pains. This amount does not affect her blood pressure or pulse perceptibly. When the effect of her first dose subsides, it may be repeated with no fear of prolonging labor appreciably nor injuring mother or child. In some cases, especially primiparae, the total duration of labor is actually shortened.

The only disadvantages that I have observed from the use of sodium amytal are that there is less cooperation from the patient during preparation and draping for the delivery. She uses her voluntary muscles less than she otherwise could to assist in expulsion of the fetus. The sodium amytal seems to make her somewhat restless, and someone must stay with her continually.

Sturre[4] reported the use of sodium amytal for full surgical anesthesia in a cesarian section and stated that the anesthetic had no depressing action on the circulatory or respiratory centers of the fetus. Mendenhall[5] reported the successful use of sodium amytal in several cesarian sections.

Sodium amytal has proven to be a safe analgesic for obstetric patients. Labor is shortened, especially in primiparae, when sodium amytal is given orally. Postpartum hemorrhage is not increased. The patient usually sleeps several hours after delivery. The babies are unaffected.

CONCLUSIONS

Sodium amytal has been given both orally and intravenously in sixty-two cases, consisting of medical, surgical and obstetric. It is very valuable in certain medical cases. As an adjunct to anesthesia for surgical operations, it lessens the amount of ether necessary and largely prevents postoperative emesis. It lessens the pangs of childbirth and is not dangerous to mother or child in moderate doses.

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[4] Sturre, J. R. and Baker, J. W.: Sodium Amytal in Cesarian Section. Min. Med., xiii, 328, May, 1930.

[5] Mendenhall, A. M.: Hysterotomy Under Sodium Amytal. Ind. Med. Jour., xxxii, 192, Apr., 1929.

MUSCULAR DYSTROPHY

IMPROVEMENT IN TREATED CASES *

PRELIMINARY REPORT

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Muscular dystrophy appearing in infancy or childhood has merited a poor prognosis. With no demonstrable causative factor to combat, treatment has of necessity been purely symptomatic. Such treatment has been largely palliative. Improvement or recovery in any individual case accorded symptomatic treatment adds nothing to our information concerning the conditions. Improvement or recovery following treatment directed at a demonstrable deviation in metabolism deserves to be recorded because it offers at least a plan for studying other cases. Without discussing classification, which is based purely on the clinical rather than on the pathologic picture, the following four cases are reported which have shown improvement under treatment directed at a demonstrated deviation in metabolism.

Case 1. R. W., male, ten years of age, seen first January, 1928, presenting a typical clinical picture of pseudohypertrophic muscular dystrophy.

Family history unimportant except that an older brother was living and well. Paternal grandfather had diabetes.

Patient had been treated for years for flat foot. At the

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* Read before a Meeting of Children's Orthopedic Hospital Staff, Seattle, Wash., Oct., 1930.

age of ten years muscular weakness became more pronounced. Following the removal of his tonsils, with the loss of considerable blood, there was rapid increase in muscular weakness. Muscular strength was so decreased the patient could not turn from a prone position.

Aside from the picture of pseudohypertrophic muscular dystrophy, examination revealed nothing of interest except a slight deviation in glucose tolerance as indicated by testing blood sugar before and after the ingestion of 75 grams of glucose. The blood sugar test gave fasting 136 mg.; 30 minutes after ingestion, 187 mg.; one hour after, 210 mg.; two hours after, 166 mg., and three hours after, 150 mg. per 100 cc.

A limited carbohydrate diet was prescribed (carbohydrate intake was limited to 100 grams). Without other medication or treatment improvement began, and continued to complete recovery. Within eighteen months he had so far recovered that he was able to carry and deliver forty Sunday papers. Within six months more he was delivering one hundred and twenty papers six days a week.

Recently he reported he had had influenza and was feeling less strong than usual. Upon questioning, he admitted he was not restricting his carbohydrate intake. After a week on restricted carbohydrate intake he reported that he felt well. Glucose tolerance tests twice since the original one have given a normal curve.

Case 2. J. S., male, aged 8, seen August 20, 1930, complaining of muscular weakness.

Family history negative. Four sisters living and well.

Patient exhibited muscular weakness at five years of age. Disability decreased more rapidly during the past year. He was so unstable he could not get about without falling. Rising from a prone to a sitting position was very difficult. Rising to a standing position was impossible.

Aside from the picture of pseudohypertrophic muscular dystrophy and poor nutrition, examination revealed nothing of interest except a retardation in return toward normal level of blood sugar, as indicated by testing blood sugar before and after the ingestion of 35 grams of glucose. The blood sugar test gave fasting 108 mg.; 30 minutes after ingestion, 125 mg.; one hour after, 125, and two hours after, 154 mg. per 100 cc. of blood.

On account of poor nutritional condition, this child was placed on an increased caloric intake. Carbohydrate intake was kept low as in the previous case. Insulin both morning and evening was administered until he had gained from 47 up to 60 pounds, normal for his height and age. Insulin was then discontinued and he was kept on a diet low in carbohydrate. The carbohydrate given consisted chiefly of vegetables and fruit.

Improvement slow but consistent was manifest from the first. The increase in weight offered a burden for him to carry. But even with it his stability increased. He was able to get about without falling. He improved so much that by Feb., 1931, he was able to rise from sitting in a chair. He handles himself on the floor much better, though he is still unable to rise to a standing position from a prone position without the aid of a chair or table.

During Feb., 1931, he was in bed five days with influenza. Recovery has been slow and March 24 sees him no further advanced than he was the middle of February. He has recovered from the setback that came with the attack of influenza. He has been flying a kite and handles himself much better than when he came under observation.

Cases 3 and 4. A. C. and C. C., females 4½ and 3 years respectively, seen first January, 1929, on account of muscular weakness.

Family history negative for history of similar affliction. Father and mother normal, healthy individuals. Mother gives a history of irregular menstruation, with cessations persisting for months. Physical conformity and fat distribution in both parents approaches the so-called pituitary type of obesity. Examination revealed nothing of interest except a high glucose tolerance, as indicated by testing the blood sugar before and after the ingestion of 100 grams of glucose. The father's blood sugar readings were: fasting 65; 30 minutes after ingestion of glucose, 129; one hour after, 83; two hours after, 64 mg. The mother's tests for similar periods were 75, 100, 100, and 70 mg.

Examination of the children revealed nothing except overnutrition, pronounced muscular weakness, and a condition in the chest of the elder chld that had been called asthma. Rales were to be heard everywhere over the chest. The older child, two and one-half years old, could not sit alone.

Fasting blood sugar in the children showed low levels of 65 and 75; further testing was not attempted. On account of the overnutrition they were put on a low caloric diet. Thus fat and rich carbohydrates were largely excluded. They were given pituitary gr. 1 and thyroid gr. 1, t.i.d. After a short time the thyroid was discontinued and the dose of pituitary doubled.

There was some improvement. The asthmatic condition in the older child cleared up. After a time the use of ephedrine was begun. With gr. ½ t.i.d. improvement seemed to be greater than without.

Before such treatment was begun, progress had been from bad to worse, and only unfavorable prognosis offered. With such treatment there has been improvement. In spite of an attack of bronchopneumonia in the older child during the winter of 1929-30, and measles in both, and bronchopneumonia in both during the winter of 1930-31, they are both able to sit up on kiddie cars and push them about on a hardwood floor. Muscular strength, though still far from normal, has gradually increased.

Increase from ½ to 1 grain of ephedrine, three times a day, has caused no distress but has seemed to be accompanied by an increase in muscle strength.

SUMMARY

Four cases of muscular dystrophy, two showing apparently a decreased tolerance to carbohydrate and two showing apparently an increased tolerance are briefly reported. Treatment has been directed at the apparent deviation in carbohydrate metabolism. Improvement has occurred. One case is apparently perfectly well. More time must elapse before a final report can be given on the other three cases. Treatment has been rational rather than symptomatic.

Improvement in these cases offers at least a suggestion for a type of investigation in similar cases.

INTRADERMAL VACCINATION [*]

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It is difficult to change a vaccination procedure that has stood the test of time and has met with success since it was first introduced. However, one is confronted by the objections of the lay people who protest that it usually leaves ugly noticeable scars and it is for this reason that many refuse vaccination or desire that the inoculation be done on dangerous areas, as the thigh. The methods of vaccination have been improved so that today rarely is it necesary to have the resulting ugly scar that one has seen so often. The old scratch method formerly used, in which a large area was inoculated with vaccine and dressings applied, has been proven to be very unsatisfactory and dangerous.

In our work with children the old scratch method was discarded and the Hill-Leake method, acupuncture or multiple puncture, as it is better known, was used. Hill[1] was one of the first to describe and popularize this method, and since then it has been adopted and recommended by the U. S. Public Health Service.[2] It was also noticed at this time that many physicians were reporting successful vaccination by the intradermal method. Wright,[3] Hoffmann,[4] Twyman,[5] Frankenstein,[6] Singer,[7] Starkey,[8] Berney,[9] Sunko,[10] Gettinger[11] and others have reported favorably on this method. For a while both methods were used but after comparison the intradermal method was adopted as being most expedient and because a larger percentage of takes resulted.

Since the adoption of this type of vaccination in 1924, we have inoculated 535 or more children from six months to fourteen years of age and have had only twenty cases that were unsuccessful. In one of our baby homes fifty-five children, two to six years of age, were vaccinated and fifty positive takes resulted. Four of the remaining five were found to have been previously vaccinated successfully. The one remaining was vaccinated again later and demonstrated a definite immune reaction. Thirty-five babies were vaccinated at another time, resulting in thirty takes. The five who did not take were revaccinated the following year with success.

In one of the baby homes the night nurse came down with smallpox and, as she circulated the entire house including the personnel, everyone was exposed. The eighty, which included a three days old premature, were vaccinated, seventy-two takes resulting. The eight who had no takes showed an immune reaction (previously vaccinated). No case of smallpox occurred in the home.

No.	Age	Takes	Immune Reactions	No Takes	Percentage
535	6 mo. to 14 yrs.	505	15	30	94
35	2 yrs. to 6 yrs.	30	5	0	100
80	3 da. to 45 yrs.	72	8	0	100
55	2 yrs. to 6 yrs.	50	4	1	98

We have been in the habit of using the deltoid region as the site of preference and have always tried to discredit the use of the thigh. Goldberger[12] published an article on the use of the axilla as a new location for vaccination. Reynault[13] states that the armpit is the best place to vaccinate children, since this region is protected and the scar is not seen. He adds that the calf and thighs are not infrequently exposed on occasions and for cosmetic reasons vaccination should not be done here. We have been using the armpit in practically all of the girls and many of the boys as the preferable site.

We have observed that a maculated lesion develops usually about the third or fourth day but may develop as late as the fourteenth day. After the macular lesion appears the vaccination progresses through the normal course, that is, pustulation fifth to twelfth day, and then the wound scales and heals within eight to twenty-nine days. When the vaccine was injected too deeply the lesion was very slow in its maturation and in many cases did not form the pustule, but formed an indurated area which did not resolve for twenty to thirty days. Three children were injected deeply and the course followed as described above. The following year they were reinoculated and demonstrated an immune reaction. A small dimple replaces the usual scar.

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[*] From the Pediatric Department, University of Oregon Medical School.

[*] Read before the Semiannual Meeting of North Pacific Pediatric Society, Portland, Ore., Jan. 24, 1931.

[1] Hill, H. W.: Smallpox Vaccination. Brit. M. J., 1:189, Feb. 10, 1917.

[2] Leake, J. P.: Questions and Answers on Smallpox and Vaccination. Pub. Health. Rep., 42:221-238, Jan. 28, 1927.

[3] Wright, L. J.: Smallpox Vaccination. J. A. M. A., 71:654, Aug. 24, 1918.

[4] Hoffmann, W.: Intradermal Vaccination. Abst. J. A. M. A., 77:1212, Oct. 8, 1921.

[5] Twyman, T.: Intradermal Vaccination. J. Mo. M. A., 19:353, Aug., 1922.

[6] Frankenstein: Deut. Med. Wchn., 48:1700, 1922.

[7] Singer, A.: Intracutaneous Smallpox Vaccination. Abst. J. A. M. A., 81:2157, Dec. 23, 1923.

[8] Starkey, F. R.: Simple Method of Vaccination. J. Mich. M. Soc., 23:70, Feb., 1924.

[9] Berney, D. E.: Intradermal Vaccination. Atlan. M. J., 27:713, Aug., 1924.

[10] Sunko: Jahrb. f. Kinderh., 108:102, March, 1925.

[11] Gettinger, J. H.: Intracutaneous Vaccination Against Smallpox. M. J. and Rec., 120:115, Aug. 6, 1924.

[12] Goldberger, I. H.: A New Site for Smallpox Vaccination. N. Y. M. J., 112:1035, Dec. 25, 1920.

[13] Reynault: J. de Practise, No. 6, 1930 (extract).

In a few of our cases there have been large swollen arms but they have always resolved. All of the children within the baby homes had at least twenty-four hours of fever from 101° to 104°. Occasionally the temperature was prolonged to three or four days. We have had no secondary infections. We use the method described by Toomey and Hauver.[14] One of the capillary tubes is broken at both ends and a tuberculin syringe with a 27 gauge needle is inserted, sucking out the contents of the tube into the syringe. Three or four drops of normal saline are then drawn into the syringe. Sometimes the vaccine adheres to the side of the capillary tube but it can be easily removed by swishing the saline into the capillary tube back and forth slowly. One-tenth cc. is then injected intradermally into the site of preference.

When a large series of inoculations are undertaken, one capillary tube is secured for every four intended vaccinations. A four or five cc. vaccine bottle is filled with normal saline, calculating 1 cc. to every ten to be vaccinated. The vaccine is then removed from the capillary tubes and injected into the vaccine bottle. Thus for eighty vaccinations, twenty tubes were used and diluted with normal saline to make 8 cc. This facilitates the giving of a large number of vaccinations. In fact, the time consumed for the eighty inoculations, including the making of the vaccine dilution and injecting, was less than ninety minutes with only one doctor and one nurse in attendance.

This type of vaccination has met with various objections in that it is more painful, that it may be given subcutaneously, that it gives different reactions which cannot be differentiated from those following other injections. We who use and are familiar with this type of vaccination do not believe that it is more painful, but on the contrary have found it is far less painful than any other form we have tried. One prick to a child is less painful than six to thirty scratches; however, the pain of either method is negligible and not a factor to determine the worthiness. When good needles are used and one is careful, there is no reason why a deeper injection than an intracutaneous should be made. Anyone familiar with the giving of Schick, Dick or Mantoux tests will have no difficulty, but for those not familiar with these methods the acupuncture or multiple puncture should be used.

CONCLUSIONS

The intradermal method of vaccination in the axilla without dressing has been our method of choice for the past two years.

1. It is less painful than other methods of vaccination.
2. One secures a higher percentage of takes.
3. The intradermal vaccination goes through the normal course of macule, papule, pustule, scale, scab, and heals leaving a small but well defined scar.
4. Secondary infections have not been noted in our series of vaccinations and no large ugly scars have been obtained.
5. This type of vaccination has been successful in a number of cases previously vaccinated by other methods.
6. The "immune reaction" is well defined by this method.
7. This method is more expedient, especially in vaccinating large groups.
8. The skin can be cleansed and injected immediately, and the surface wiped with alcohol after vaccination without killing the virus.
9. There is no need of dressing the vaccination as the skin closes automatically, sealing the wound and cutting down the chances of infection.
10. The intradermal method should only be used, however, by those familiar with the giving of intradermal injections, such as the Schick, Dick or Mantoux tests.

CONVULSIVE SEIZURES FOLLOWING THE APPLICATION OF PHENOL TO THE SKIN*

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Although phenol is probably the most common antipruritic used in the treatment of skin diseases, serious systemic reactions due to absorption are extremely unusual. In a search of the literature I have been able to find but nine such cases recorded. For this reason I believe the recording of a tenth case will be of interest.

REPORT OF CASE

History. The patient was an American spinster, 82 years old. She was admitted to the New York Skin and Cancer Hospital April 28, 1930, on the service of Dr. Eugene F. Traub. At this time she was complaining of an intense itching of the skin and a scaly eruption of the scalp, both conditions having been present for about one year. Except for typhoid fever as a child and slight eczema of the arms during childhood, her health had always been good. She had never had fainting spells or convulsions of any kind. Her family history was also negative.

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[14] Toomey, J. A. and Hauver, R. B.: Intradermal Vaccination. Am. J. Dis. Child., 35:186-192, Feb., 1928.

* Read before the Clinical Society of the New York Skin and Cancer Hospital, New York City, March 27, 1931.

Physical examination. Examination revealed a seborrheic dermatitis of the scalp and severe excoriations of the skin over the arms, chest, back and legs, also a mild right-sided facial paralysis, slight enlargement of the heart, moderate enlargement of the liver and spleen, a fecal mass in the lower bowel, slight edema of both legs, a blood pressure of 150/70 and severe hemorrhoids together with a prolapsus ani. Urinalysis and the Wassermann were negative, and blood chemistry was normal.

Treatment and course. The patient was under observation for six months. Treatment in general during this time consisted of low carbohydrate diet, soothing skin applications, and occasional intravenous injections of strontium bromide. Her condition improved and for some time she was quite comfortable.

Beginning May 13, a calamine and zinc lotion containing one per cent of phenol was applied once each day to the body. On the morning of May 30, shortly after the application of this lotion, the patient suddenly complained of weakness and dizziness and collapsed to the floor. She was taken to her bed, babbling incoherently, where she underwent a continuous generalized clonic convulsion which lasted one hour and forty-five minutes. It was impossible to arouse her, the pulse was very feeble, rapid and intermittent and at times imperceptible; the limbs were cold, clammy and semirigid; there were spasmodic twitchings of individual muscles and muscle groups; the pupils were slightly dilated, and respirations were stertorous and moaning. Heat was applied externally and adrenalin administered by hypodermic injection without relief.

The convulsion continued for about one hour and a half. One-sixth grain of morphine sulphate was then given by hypodermic injection. This was followed by improvement. The pulse became slower and stronger and was soon counted at 130. The convulsions gradually subsided and within thirty minutes the patient was conscious and comfortable. She had no recollection of the attack. The urine was dark in color, otherwise negative. The lotion containing phenol was discontinued and after a day's rest in bed, the patient appeared to have returned to her usual normal.

Aside from a slight bromide rash and a neuritis of the shoulder, the patient remained quite comfortable until July 3. On June 26 a lanolin compound containing one per cent phenol was started for one application to the body each day. After seven days of this the patient was again seized with a convulsion. It came on shortly after the application of the ointment and was identical with the previous attack except that it lasted but forty minutes. The next day she was again apparently fully recovered.

Phenol was applied a third time. Commencing July 21, a calamine and zinc lotion containing one per cent phenol was again started. One application was made each evening. On the fourth evening a third attack of coma and convulsions took place. This attack lasted thirty minutes. The patient again received morphine and recovered as before.

Urinalysis was as follows: Color, dark amber; reaction, acid; specific gravity, 1020; albumin, negative; sugar, negative; indican, negative; microscopic, uric acid crystals, a few red blood and epithelial cells.

No more phenol applications were given the patient and she had no more convulsions. On November 9, 1930, she died of pneumonia, contracted during an acute exacerbation of her skin condition. Autopsy was refused.

REVIEW OF LITERATURE

Forbes[1] first described poisoning from the external aplication of carbolic acid in 1880. At that time it was being used lavishly as a disinfectant. He mentioned fifteen cases seen by Tardieu and five by Kuster of Berlin. He observed two forms of carbolic acid poisoning, one of sudden onset, often without apparent cause, and one of insidious onset. He also described the symptoms and the characterization of the urine, including a chemical test for carboluria.

Brown[2] very briefly reported a case in a child of three. Pure carbolic acid (mistaken for a carbolized oil cleansing fluid) had been applied to the child's scalp. Five minutes after application of the acid, the child was in coma and unconscious. It remained comatose for five hours but recovered. The urine was olive green and contained albumin for three days.

Lucas and Lane[3] reported two cases of "carbolic acid coma," induced by the application of carbolic compresses to the skin. In routine preparation of patients for operation, it was their custom to apply phenol solutions, usually five per cent, to the skin over the operative field for a variable time before operation. Among many hundreds of cases thus prepared for operation, they observed two of poisoning, in which complete coma developed and lasted for several hours. Both cases recovered. Following is a summary of their report of these cases:

Case 1 was a boy, age 15, with an abscess of the leg. A five per cent phenol compress was applied to the leg at noon and at 12:20 the next morning he was found insensible. The pulse was imperceptible, the heart rate 200, breathing was stertorous and moaning, vomiting had occurred, there was an aimless moving about of the extremities, and a cold, clammy perspiration, the pupils were small, reacting slightly, the pulse rapid and feeble, and the temperature 101.8° F. The urine was dark in color. At ten o'clock the next morning he had partially regained consciousness but was dull and stupid all day. At the end of three days he had apparently fully recovered. Six days later carbolic acid was again applied. This was followed in a short time by another attack. The urine was dark for two days.

Case 2 was a boy, age 6½, with a swelling in the right iliac fossa. Carbolic acid, five per cent, was applied to the leg at 12:30 p.m. Reaction was noted at 1:30 p.m. The child was groaning, pale, collapsed and comatose. There was marked dyspnea, convulsive twitchings of the eyelids and limbs, a rapid, feeble and intermittent pulse, tetanic contractions of the muscles of the forearms and hands, dilated pupils, profuse perspiration, and vomiting of dark fluid. This condition lasted about six hours but it was several days before the child was restored to its usual health. The urine was acid, dark in color, showed slight deposits of urates, and gave slight positive reactions for phenol and its derivatives.

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[1] Forbes, Litton: Carbolic Acid Poisoning. Lon. Med. Rec., 8:173, May 15, 1880.

[2] Brown, W. H.: A Curious Case of Carbolic Acid Poisoning. Lancet, p. 543, Mar. 2, 1895.

[3] Lucas, R., Clement and Lane, Arbuthnot, W.: Two Cases of Carbolic Acid Coma Induced by the Application of Carbolic Compresses to the Skin. Lancet, 1: 1362, June 1, 1895.

Abrahams[4] reported a fatal case in an infant of seven days. The nurse accidentally touched pure phenol to the baby's groin. Five minutes later the child was in convulsions and death ensued in ten hours.

Crawford[5] reported a case of coma in a child of four following carbolic compresses (1 to 40), applied before an operation for genu valgum.

Wainwright[6] reported a case of carbolic acid poisoning in an adult, following the application of a four per cent solution to the lower abdomen for itching. There was no coma in his case but intense pain requiring repeated doses of morphine. This was followed by evidence of highly inflamed kidneys with recovery in ten days.

Raubenheimer[7] reported a case in a child of six, following the application of a carbolic compress (1 to 40) in preparation for an operation for genu valgum. There was complete recovery.

Gibson[8] reported the death of a lad of 13. Carbolic was accidentally spilled on the scalp and cheeks, but none entered the nose and throat. Reaction was noted in five or ten minutes. Death occurred from shock.

Turtle and Dolan[9] reported a case of rapid absorption of carbolic acid through the skin. While carrying a bottle of acid in his pocket, the patient, an adult, accidentally broke it and the contents ran down over the scrotum and thigh. Within twenty minutes, the patient was unconscious and twitching, breathing was noisy and snoring, the lungs were filled with mucous rales, pupils contracted, but the pulse remained regular and full. Later his irritation increased and vomiting occurred. The next day, after regaining consciousness, he complained of an annoying cough and severe abdominal pains, vomited green fluids, and passed bloody urine. Complete suppression of urine followed and death occurred on the tenth day. Autopsy revealed an acute hemorrhagic nephritis.

COMMENT

Applications of weak phenol preparations to the skin are usually well tolerated. In some individuals, however, there exists a marked hypersensitiveness to this drug and the application of phenol preparations to these individuals produces severe reactions which may subsequently result in death. Fortunately, such hypersensitivity is extremely rare.

The early symptoms associated with such reactions are extreme collapse and coma, rapid feeble pulse, convulsive twitchings, cold clammy perspiration, and stertorous breathing. In addition, there may be vomiting. The pupils may be dilated or contracted. The urine is usually very acid and very dark. In some cases positive reactions for phenol and its derivatives may be found in the urine. Such findings are considered proof of the absorption of the phenol.

I regret that the urine of the case herein reported was not examined for phenol. However, in spite of this lacking evidence, I feel no hesitancy in attributing the attacks to phenol. It would seem extremely unlikely that three such severe convulsive seizures, each following the application of phenol, could be mere coincidence. At no other time during the six months that the patient was under observation, did she show any tendency to fainting or convulsion. Moreover, careful questioning of the patient and her relatives brought forth emphatic denials of any such previous attacks.

It is interesting to note the cumulative action of the drug. The first attack occurred after seventeen days of phenol, the second after seven days, and the third after but four days. Apparently the patient's sensitiveness to the drug increased with each subsequent application. It would have been interesting to have applied the drug again for experimental purposes but, in view of the severe nature of her reactions, it was not considered justifiable.

403 Medical Arts Bldg.

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[4] Abrahams, R.: A Fatal Case of Carbolic Acid Poisoning in an Infant, Due to Absorption by the Skin. Pediatrics, N. Y., IX:241, 1900.

[5] Crawford, D. Douglas, with remarks by Dr. Henderson: A Case of Coma from the Application of Carbolic Compresses to the Unbroken Skin. Lancet, p. 1011, April 6. 1901.

[6] Wainwright, J. W.: Poisoning from the Application of Carbolic Acid to the Unbroken Skin. Bost. Med. and Surg. Jour., CXLVI:361, 1902.

[7] Raubenheimer, J. A.: A Case of Carbolic Acid Poisoning due to External Applications. Lancet, 1:1098, 1903; also Brit. Med. Jr., 1:1145, May 16, 1903.

[8] Gibson, W.: Death from Carbolic Acid Burn. Queen's Med. Quart. X (old series), 133. 1905.

[9] Turtle, W. R. M. and Dolan, T.: A Case of Rapid and Fatal Absorption of Carbolic Acid Through the Skin. Lancet, 2:1273, Dec. 16, 1922.

Prevention of Spinal Cord Degeneration in Pernicious Anemia. A survey of the clinical course of eight patients with pernicious anemia and spinal cord degeneration observed by Paul Starr, Chicago (*Journal A.M.A.*, April 11, 1931), indicates that they may be divided sharply into a group of four that have grown steadily worse. The period of observation in five of these cases is more than three years; the others have been followed from one and a half to two and a half years. Patients who received specific antianemic substance to keep the red blood cell count above 5 million per cubic millimeter did not have progressive degeneration of the central nervous system in contrast to those who were allowed to remain even slightly anemic, in whom progressive degeneration did occur.

A STUDY OF SEDIMENTATION TIME FINDINGS IN ORTHOPEDIC CONDITIONS

RESULTS FROM A STUDY OF 325 SEDIMENTATION TESTS OF 230 CASES *

William E. Grieve, M.D.
SPOKANE, WASH.

There are many methods of doing the sedimentation test, and most writers use some modification. This results in some confusion in comparing the results of different workers. Since the war there has been a great deal of work done on the subject, but most of it is reported in European literature.

Ness[1] summarizes the history of the test and describes the Lenzenmeier method. I have used this method and believe that its simplicity and the ease of recording results makes it practical. The results, I believe, are accurate enough for ordinary purposes.

The materials used are :

1. One cubic centimeter tuberculin syringe.
2. Several settling tubes which are made from glass tubing five millimeters in diameter. In making these tubes, pieces of glass tubing seven centimeters long are cut off. One end of the cylinder is annealed in a bunsen flame. These tubes are then graduated by placing in each of them one cubic centimeter of water, and marking the tube at the level of meniscus with a file. Below this, one cubic centimeter line at distances of six, twelve, eighteen, and twenty-four millimeters respectively, other marks are made.
3. A flask of sterile five per cent sodium citrate.

To do the test the settling tube should be absolutely dry and clean and placed in a rack which holds the tube in a vertical position. (The rack can be made by drilling holes in a block of wood.)

The syringe should be rinsed with sodium citrate solution. Two-tenths cubic centimeter of the five per cent solution is drawn into the syringe.

The cubital vein is punctured after short stagnation of the blood, and the syringe is filled to one cubic centimeter. The entire mixture is immediately transferred to the sedimentation tube. The tube should be inverted several times to get an even mixture of the blood with the citrate solution. If clots form, the test should be discarded. Care should be taken not to mix the different bloods when several tubes are set in the same rack.

To read the test, it is only necessary to note the time which is required for the upper level of the cells to reach six, twelve, eighteen, and twenty-four millimeters. Linzenmeier advised using eighteen millimeters for the end point. After I had become familiar with the test, I used only the eighteen millimeters reading, and found it to be very satisfactory.

If for any reason one should omit reading the test at the proper time, the suspension can be remixed and the cells allowed to settle as before. However, this may vary a few minutes from the first reading. Gresheimer[2] has shown the relationship between the fibrin content of the plasma and the sedimentation time in orthopedic cases. Hunt[3] has shown the variations of the erythrocytic count as well as the fibrin content of the blood exert a marked influence on the sedimentation reaction.

It has been demonstrated by some observers that the property of blood, which causes the cells to sink rapidly, is in the serum rather than the cells. The theory has also been advanced that the clumping of cells before settling was due to an increased electric charge on the cells, while others suggest that it is due to an increased adhesiveness of the cell surfaces. Whatever the physiology of the reaction is, we know that, if there is an absorption of the products of the destruction of the tissue such as occurs in trauma, the break down of a tumor or in an inflammatory process, the speed of the settling of the red cells is increased.

TABLE OF FINDINGS

Disease	No. of Cases	Average	Range
Normals	8 young men	605 min.	130 to 380 min.
	8 young women	237 min.	130 to 380 min.
Infan. para	6	107 min.	117 to 270 min.
Spastic para	4	197 min.	150 to 280 min.
There is a marked drop postoperatively apparently due to absorption of blood, as low as 30 in a knee.			
Perthe's disease	8	204 min.	120 to 336 min.
Separation femoral epiphysis	2	160 min.	120 to 200 min.
Osteochondritis vertebra	3	19 min.	148 to 440 min.
Osteomyelitis of vertebra closed	3	19 min.	14 to 30 min.
Chronic osteomyelitis of sacroiliac	2	25 min.	18 to 32 min.
Chronic osteomyelitis	25	36 min.	9 to 90 min.
Bone T. B. secondarily infected	17	31 min.	14 to 73 min.
Secondarily infected tuberculosis gives about the same sedimentation time as osteomyelitis.			

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* From the Orthopedic Department of the State University of Iowa Hospital under the direction of Dr. Arthur Steindler.

[1] Ness, O. R.: The Red Cell Sedimentation Test. U. S. Naval Med. Bull., 471-477, Dec., 1925.

[2] Greshmeier, Esther M.: The Relationship between Fibrin Content and Sedimentation Index in Orthopedic Cases. Am. Jour. Dis. Child., 953, May, 1929.

[3] Hunt, Henry F.: Studies of Sedimentation of Erythrocytes. Jour. Lab. and Clin. Med., 1061-1075, Aug., 1929.

T. B. spine closed	12	98 min.	24 to 338 min.
T. B. hip closed	15	98 min.	28 to 174 min.
T. B. knee	12	112 min.	31 to 174 min.

The patient with 31 had multiple foci and was in poor general condition. The one with 300 had an active recurrence, but seemed to be in good condition with disease of 20 years standing.

T. B. wrist	2	106 min.	77 to 135 min.
T. B. sacro-iliac, closed but active	1	146 min.	
Chronic infectious arthritis	23	71 min.	14 to 170 min.

Other observers have reported a normal sedimentation time in chronic arthritis.

Charcot shoulder with hemorrhage	1	15 min.	
Charcot hip with secondary infection	1	23 min.	
Charcot knee	1	180 min.	
Syphilitic arthritis of knee	2	58 & 94 min.	
Thromboangitis obliterans	1	300 & 360 min. 2 months apart	
Arthritis dissicans of ankle	1	170 min.	
Hemophilia with symptoms similar to T.B. of hip	1	172 min.	
Sciatic neuralgia	1	540 min.	
Hodgkin's disease with metastases to vertebra	1	45 min.	
Secondary malignancy of vertebra	1	46 min.	
Fibrosarcoma of patella	1	66 min.	
Paget's disease	1	17 min.	
Osteitis fibrosa cystica of tibia	1	180 min.	
Large pyogengenic abscess, no apparent bony focus	2	22 min.	18 to 27 min.

CONCLUSIONS

1. An explanation should be sought in any apparently healthy individual if sedimentation time is less than one hundred and fifty minutes.

2. The sedimentation time corresponds to the general condition and parallels its improvement.

3. It is of value when it is considered in conjunction with the clinical and laboratory findings both in diagnosis and prognosis, but will not take the place of clinical observation and other laboratory procedures.

4. The wide variations in readings in different individuals with the same diagnosis can sometimes be explained by clinical observation of the general condition or a second diagnosis. Sometimes no apparent cause for the variation can be found.

5. Before the test can be of very great value, the technic must be standardized and much work must be done.

6. Records should be made of the red cell count, white count, and temperature taken of the patient at the same time as the blood for the sedimentation test in order to properly evaluate the findings.

METHOD OF ENUCLEATION OF THE EYEBALL *

Noble Dick, M.D.
SEATTLE, WASH.

One of the most difficult and annoying steps in the enucleation of an eye is the severing of the optic nerve and remaining tissue after dissection. All of us who have done enucleations of the eye have been greatly annoyed with hemorrhage, while clipping the remaining tissues from the globe after severance of the optic nerve and vessels. This hemorrhage is easily controlled, when we are finally able to remove the globe from the orbit.

The many complicating and necessarily painstaking methods, as so often described, urge us on to something more efficient. The two main points which I wish to emphasize are the severance of the optic nerve and the closure of Tenon's capsule.

The patient is prepared in the usual way for the anesthetic of choice. We prefer local or amytal. The local field is made as aseptic as possible with castile soap, water and a weak solution of bichloride of mercury. The eye speculum is then introduced. With a pair of curved scissors the surgeon carefully cuts the conjunctiva close to the cornea, then dissects back into the fornix, care being taken to free the entire conjunctiva from the cornea and underlying tissue.

With a squint hook the internal rectus muscle is freed and severed close to its insertion into the globe. The other recti muscles are severed in like manner. The closed curved scissors are then inserted under the internal rectus muscle and by opening and closing the scissors Tenon's capsule and the underlying bands of fibrous tissue are freed from the globe. The globe should be freely movable in the orbit.

The next step is severance of the optic nerve and vessels. The stump of the internal rectus muscle

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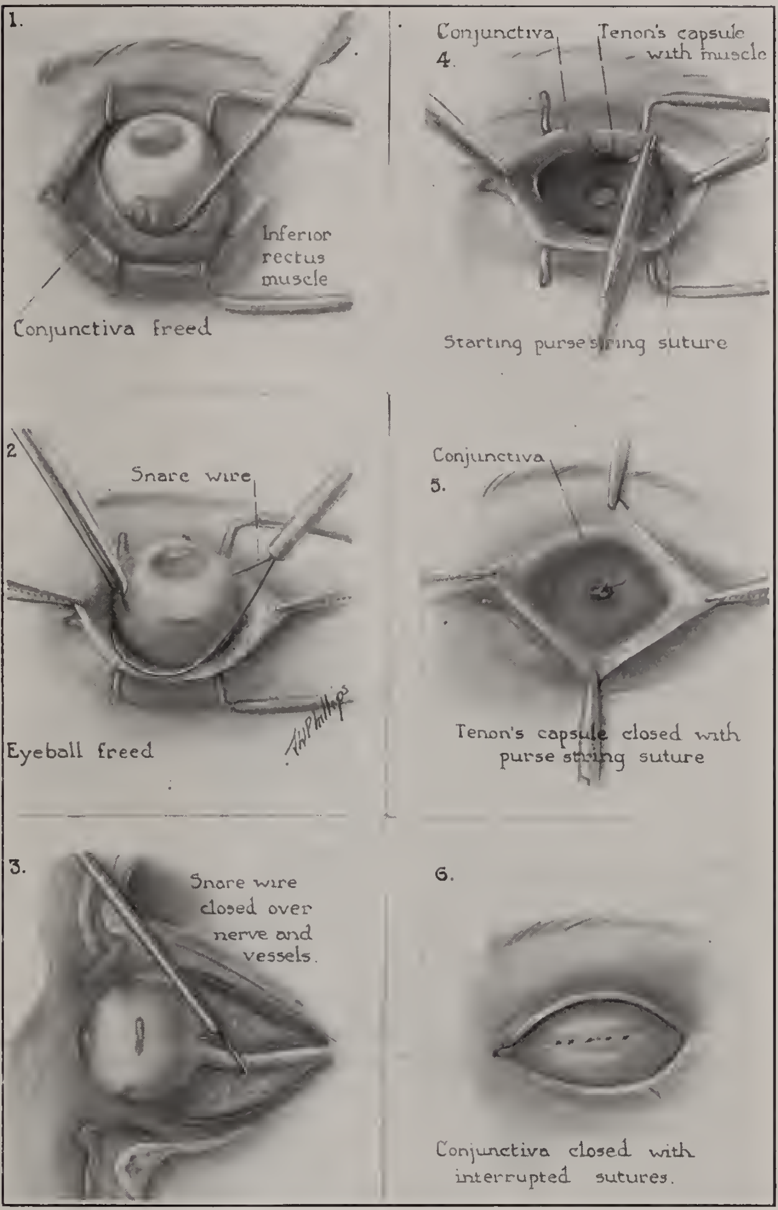
* From The Mason Clinic.

is grasped with a hemostat and the globe fixed. The wire in a nasal polyp or tonsil snare is passed over the hemostat and globe from the temporal side. The wire is then passed downward over the globe, and very slowly closed until we feel that the optic nerve is incorporated in the wire. Completely closing the wire snare severs the optic nerve and all remaining tissue. The length of the optic nerve stump remaining on the globe depends on the downward pressure of the snare. When the nerve is severed, the globe can be quickly removed from the orbit and the minimum amount of hemorrhage easily controlled with a little pressure.


1.
Inferior rectus muscle
Conjunctiva freed
Conjunctiva
Tenon's capsule with muscle
4.
Starting purse string suture
2
Snare wire
Eyeball freed
AWPhillips
Conjunctiva
5.
Tenon's capsule closed with purse string suture
3.
Snare wire closed over nerve and vessels.
6.
Conjunctiva closed with interrupted sutures.

Anatomically all of the recti muscles are incorporated in Tenon's capsule. This fact is made use of in closing the wound. A purse string suture of plain catgut is placed in Tenon's capsule, care being taken to include the cut ends of the recti muscles in our suture. This closure gives us a freely movable stump with all the recti muscles approximated in the same relative position as before they were severed from the globe.

The conjunctiva is closed with three or four interrupted sutures of plain catgut or black silk. Antiseptic ointment is then placed in the conjunctival sac and a snug bandage applied, covering both eyes. This bandage is changed on the third day and the good eye left uncovered. The wound heals quickly and the artificial eye may be inserted within ten days or two weeks.

CONCLUSIONS

1. Operation by the snare method is easily and quickly done. The hemorrhage is inappreciable.

2. Closure of Tenon's capsule is quicker than the muscle approximation closure and gives us a good, freely movable stump. The introduction of bone cartilage, glass or gold balls, etc. into Tenon's capsule is unnecessary.

HEPATITIS. John B. Deaver, Philadelphia (*Journal A. M. A.*, April 18, 1931), gives acute and chronic attacks, and chronic with recurrent acute or subacute attacks of infectious activity in the gallbladder region as forerunners of hepatitis, varying from purely degenerative changes to a mildly acute suppurative inflammation, to chronic fibrosing, specific tissue-destroying processes leading to early death from sepsis or to late death from toxemia and loss of liver function, preceded by prolonged invalidism. The treatment of hepatitis is both operative and nonoperative. Operative treatment may be preventive or curative. To be preventive, it must be instituted early before the infection has traveled on its devious roads. This means that removal of the gallbladder alone ordinarily suffices. But when the infection has reached the liver, cholecystectomy is not sufficient. Nothing short of removal of the gallbladder together with T-tube drainage of the common duct will answer. If the latter is carried out comparatively early, it may still be preventive and head off a peripancreatic lymphadenitis as well as other sequelae.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington and Idaho
Devoted to the Interests of the Medical Profession of the Pacific Northwest
Editorial Office, 543 Stimson Building, Seattle, Wash.
MAY, 1931

EDITORIAL

THE BASIC SCIENCE LAW IN OREGON

In order to place a check on licensing practitioners of inadequate medical education and deficient qualifications, the basic science law has been established in a number of states, as a result of which there has been an immediate and striking reduction in the number of objectionable irregulars who have hitherto been licensed in large numbers by their respective examining boards. An attempt has been made at several sessions of the Oregon Legislature to enact such a law. While these have failed in the past, it was believed that the effort would be successful at the legislative session of last winter. A committee of leading practitioners from many cities of the state worked zealously in preparation for such legislative action. A physician was elected to the Senate and two to the House, who were appointed on their respective committees dealing with medical affairs.

The contest on this bill centered in the Senate Committee on Medicine, Pharmacy and Dentistry. A Portland senator, who is an optometrist and optician with a fixed antipathy against the medical profession, was a member of this committee. Apparently his chief purpose was to block this bill. It had a stormy existence both in committee and before the Senate by reason of the activities of this man and other antimedical sympathizers. When it finally reached the floor of the Senate a prolonged and exciting controversy ensued. The leading opponent of the measure with vindictive vituperation assailed the medical profession, alleging many mendacious charges which, however, were successfully met and disproven by Dr. Booth, the medical senator. While the bill had been presented for passage as a majority report from the committee, the optometrist senator succeeded in getting his minority report for disapproval before the Senate for final passage, which was adopted by a vote of 16 to 14. By this time the session was so nearly ended that it was not possible to have the bill reconsidered.

Although this failure has resulted in much disappointment and regret, yet it has been successful as a state-wide educational movement. It was stated that no measure before the legislature received more intense consideration than this bill. It elicited the interest of the newspapers of all cities with abundant editorial comment approving the objective which it aimed to attain. Probably by no other means could the people of the state have received as much information concerning the deficiencies and the discredited qualifications of chiropractors and other drugless healers as was disseminated by this legislative controversy. Medical practice acts now exist and are functioning in Connecticut, Washington, Wisconsin, Minnesota, Nebraska, Arkansas and District of Columbia. It is believed in consequence of the diffusive publicity which has resulted from this legislative controversy and the information which will be transmitted during the next biennium, that Oregon will be added to the list of basic science states at its next legislative session.

STANDARDIZED PHYSICAL THERAPY

During the last decade physical therapy has developed into a useful factor in medical and surgical practice. At the beginning it was regarded with suspicion and disfavor, partly due to the fact that this form of practice had been ardently featured by various classes of irregular practitioners and also to the exaggerated and unwarranted claims for results which were unwisely and hastily proclaimed by some enthusiastic practitioners without adequate proof to substantiate them. As the result of experience and experiment with different agencies in this line of practice, there have evolved certain forms of therapy which produce results where other forms of treatment are ineffective. Even at this time, however, the great majority of practitioners are unfamiliar with apparatus and technic to such an extent that they are not in a position to direct or efficiently practice physical therapy. Consequently there is need of supervision concerning various forms of appartus and advice as to the investment of funds on the part of those inexperienced with this form of practice.

The increasing popularity of physical therapy has resulted in a multiplicity of certain forms of apparatus, which have been confusing even to those possessing some familiarity with these agencies. This has been most markedly illustrated of late in the confusing array of lamps of various designs, widely advertised as generators of ultraviolet light. Beside accepted and dependable quartz tubes and the carbon arc as generators of ultraviolet, there have been manufactured a great variety of other lamps with the alleged property of developing these rays, some delivering undetermined and others negligible quantities. Some of these have been widely advertised with questionable and often impossible claims for therapeutic results. The average physician seeking to purchase such a lamp for his use or for recommendation to a patient has no means of determining or choosing a product of efficiency. Acting wisely he will first consult someone with experience with this form of apparatus and defer purchase until information has been attained. It may not be generally understood that the American Medical Association has a Council on Physical Therapy which is constantly engaged in investigations concerning apparatus employed, aiming to standardize them as well as their use in this line of therapy. This has already been partially accomplished and in time data as to standardization will be completed. Through cooperation with the Bureau of Standards at Washington, study and investigation have been devoted to new forms of apparatus advertised before the medical profession. Information concerning these can be obtained by any physician who will write to A. M. A. headquarters, seeking knowledge regarding these matters. He may thus be wisely guided both as to the expenditure of money and results to be anticipated in practice.

THE MENTAL PATIENT IN THE GENERAL HOSPITAL

It has always been a problem how to dispose of the patient afflicted with mental disturbance of a mild degree for the purpose of observation and treatment. The average insanity commission must choose in its recommendation to the judge between commitment to the state hospital or the county jail. Often times the diagnosis of insanity is uncertain and some mild cases may be restored to health after a brief period of treatment. If this can be accomplished without placing on the afflicted individual the stigma of treatment in the state hospital for the insane, much satisfaction will result. The solution of this problem seems to be suitable provision in the general hospital for treatment over a limited period of time.

A recent report from the National Commission for Mental Hygiene of New York City gives the result of a questionnaire sent to 600 hospitals approved for intern training by the Council on Medical Education and Hospitals of the American Medical Association. Each of these was requested to furnish information regarding clinics and psychopathic wards, where examination or treatment might be given to mental patients. Four hundred twenty-one hospitals replied, of which 122 reported special facilities, with 3298 beds for the treatment of such patients. Fifty-six of these are provided with special mental wards, while a larger number have clinics only, some having the two combined. Harborview Hospital of Seattle has one floor devoted to this class of patients, consisting of a male and female ward with capacity of about forty beds. This report indicates an increased number of general hospitals which are providing for this class of patients. Hitherto the National Committee's list has contained the names of only about fifteen widely known hospitals with psychopathic wards, mental clinics or both, a large proportion of which have been conducted by state hospital departments.

THE INCREASE OF CHILDLESS FAMILIES

The Milbank Memorial Fund of New York maintains a Division of Research to study problems of public health and related conditions. An analysis of childless marriages is one of the problems on which it has recently been engaged. The data on which this study was made were taken from the 1910 census. It has found there are nearly twice as many childless families in cities as compared with country districts. A study was made of 69,620 married women of native white parentage. Among those of forty to forty-nine years of age, sixteen per cent living in cities were childless as compared with nine per cent living in the country. The urban statistics were obtained from thirty-three northern states of 100,000 to 500,000 population, while the rural data came from seventy-four counties neighboring the cities.

Childless marriages were found to be two and one-half times as common among professional people in the cities as among farm laborers. In the city groups, eighteen per cent of the wives of professional men and sixteen per cent of those of business men were childless, as compared with fifteen per cent of skilled workers and fourteen per cent of unskilled. Among the rural groups ten per cent of the wives of farm owners and seven per cent of farm renters and laborers were without children. Whether birth control or decreased fecundity has a bearing on this situation is problematical. It is not apparent from the data analyzed whether the greater frequency of childless families among urban married people represents choice, sterility or both. It seems likely, however, that the greater expense of having children in cities and the high standards of living among professional people may encourage birth control to a greater extent among the so-called upper classes. These interesting facts are worthy of consideration. Their bearing on future population may at least be suggestive and will probably provoke various grades of interest among different individuals.

CONTROL OF CANCER CAMPAIGN

Under the auspices of the American Society for the Control of Cancer, efforts are being made in most of the states to impart information for public consumption regarding the control of cancer. In all states where this work is being conducted state chairmen are designated to conduct intensive work in properly presenting the desired information to the public. Such have been appointed in Oregon, Washington and Idaho for this purpose. As suggestive of what these systematic educational efforts may accomplish a brief outline is presented of the proceedings under direction of Dr. H. J. Whitacre of Tacoma, chairman for Washington. A committee has been set up in the main cities of the state with a local chairman in each. The chairmen of the different cities have been requested this year to make a showing of Canti and Lewis films, together with an appropriate program concerning cancer. During January of this year such showings were made in Aberdeen, Everett, Seattle, Spokane, Walla Walla, Wenatchee and Yakima. It is said that a good attendance greeted the program in each city. Literature obtained from the American Society for the Control of Cancer has been presented to each chairman with the request for its distribution. This plan will be continued throughout the year with special efforts to get this material to doctors and nurses.

Another element in the program will be the establishment, if possible, of cancer committees for cancer service in some of the hospitals. Such a committee is soon to be inaugurated in Tacoma General Hospital in accordance with the plan outlined by the American College of Surgeons. When this work has become established and working satisfactorily, it is planned to inaugurate similar services in hospitals in other cities. This brief statement suffices to indicate the lines of work which are contemplated for the different cities in our states of the Northwest in an effort to establish at least a beginning for cooperation of the general public in combatting this widespread and universal disease.

THE PACIFIC NORTHWEST MEETING IN SEATTLE

The ninth annual meeting of Pacific Northwest Medical Association will be held in Olympic Hotel, Seattle, June 25-27. Daily sessions will be held from 8:30 a.m. to 6 p.m., with intermission for luncheon from 12:30 to 2. The first three days of the week will be devoted to clinics and demonstrations at new Harborview and other hospitals by members of the Seattle profession.

At the meeting in Butte last summer, an innovation was introduced by having an authority on eye, ear, nose and throat work who delivered a series of lectures on this specialty. This was so satisfactory that Dr. Robert Ridpath, professor at Temple University Medical School, Philadelphia, will give a series of addresses based on a review of rhinolaryngology. Other speakers will present various phases of medical and surgical practice, the details of which will be observed from the following program. There will be a general session each morning, with sectional gatherings in the afternoons. Entertainment will comprise a smoker on the evening of Thursday, June 25, a dinner on Friday evening and entertainments by various groups on Saturday evening.

Owing to the illness of Dr. Frederick Epplen, secretary-treasurer, the details of this meeting are in the hands of Dr. George W. Swift, secretary pro tem, 902 Boren Avenue, Seattle. Additional information that may be desired can be obtained by addressing the secretary. Reduced railway fares will be obtainable on the identification plan. One should remember that the identification ticket should be secured when purchasing transportation to Seattle.

ROSTER OF SPEAKERS

Charles R. Austrian, A.B., M.D., Associate Professor Clinical Medicine, Johns Hopkins University, Baltimore, Maryland.

A. Elmer Belt, A.M. M.D., Associate Professor of Surgery and Urology, College of Medical Evangelists, Loma Linda, California.

Leo Buerger, A.M. M.D., Professor of Surgery and Urology, College of Medical Evangelists, Loma Linda, California.

Samuel R. Cunningham, M.D., Professor of Orthopedic Surgery, University of Oklahoma, Oklahoma City, Oklahoma.

William Dock, B.S., M.D., Assistant Professor of Medicine, Medical School, Stanford University, San Francisco, California.

Dean Lewis, Sc.D., M.D., Professor of Surgery, Johns Hopkins University, Baltimore, Maryland.

Arno B. Luckhardt, Ph.D., M.D., Professor of Physiology, University of Chicago, Chicago, Illinois.

Frederick L. Reichert, Ph.B., M.D., Associate Professor of Surgery, Medical School, Stanford University, San Francisco, California.

Robert E. Ridpath, M.D., Professor of Rhinolaryngology, Temple University Medical School, Philadelphia, Pennsylvania.

Leo C. Rigler, B.S., M.B., M.D., Associate Professor of Roentgenology, University of Minnesota, Minneapolis, Minnesota.

Walter M. Simpson, M.S., M.D., Director Diagnostic Laboratories, Miami Valley Hospital, Dayton, Ohio.

Cyrus C. Sturgis, B.S., M.D., Professor of Medicine, University of Michigan, Ann Arbor, Michigan.

Owen H. Wangensteen, Ph.D., M.D., Associate Professor of Surgery, University of Minnesota, Minneapolis, Minnesota.

Leslie T. Webster, A.B., M.D., Associate Member of the Rockefeller Institute, New York City, New York.

PROGRAM

THURSDAY, JUNE 25

MORNING MEETINGS

8:30-9:30. Dr. Arno B. Luckhardt: "Studies on the Knee Jerk with Practical Application Arising from These Studies." (Illustrated.)
9:30-10:30. Dr. Dean Lewis: "Infections."
10:30-11:30. Dr. Charles R. Austrian: "Some Nontuberculous Basal Pulmonary Infections."
11:30-12:30. Dr. Leslie T. Webster: "A Review of Experimental Epidemiology."

AFTERNOON MEETINGS

Surgery

2:00-2:45. Dr. A. Elmer Belt: "Perineal Prostatectomy; the Closed Method."
2:45-3:30. Dr. Leo Buerger: "The Pathology of Organic Diseases of the Vessels of the Extremities."
3:30-4:15. Dr. Samuel R. Cunningham: "Diagnosis and Treatment of Fractures of the Vertebral Column."
4:15-5:00. Dr. Frederick L. Reichert: "The Tics of the Cranial Nerves."
5:00-5:45. Dr. Owen H. Wangensteen: "The Diagnosis and Treatment of Acute Intestinal Obstruction."

Medicine

2:00-3:00. Dr. William Dock: "Clinical Significance of the Electrocardiograph."
3:00-4:00. Dr. Leo G. Rigler: "Roentgen Diagnosis of Pleural Disease."
4:00-5:00. Dr. Walter Simpson: "Tularemia."
5:00-6:00. Dr. Cyrus C. Sturgis: "Treatment of Pernicious Anemia."

Otolaryngology

10:00-12:00 } Special for Otolaryngologists.
3:00- 5:00 } Dr. Robert E. Ridpath: Review of Rhinolaryngology.

FRIDAY, JUNE 26

MORNING MEETINGS

8:30-9:30. Dr. Arno B. Luckhardt: "Our Knowledge of the Parathyroid Glands." (Illustrated.)
9:30-10:30. Dr. Dean Lewis: "Tumors of the Breast."
10:30-11:30. Dr. Charles R. Austrian: "Occlusion of the Coronary Artery."
11:30-12:30. Dr. Leslie T. Webster: "Modern Problems in Human Epidemiology."

AFTERNOON MEETINGS

Surgery

2:00-2:45. Dr. A. Elmer Belt: "The Transverse Cystotomy; a Safe Method of Opening the Bladder."
2:45-3:30. Dr. Leo Buerger: "The Clinical Features of Circulatory Disturbances of the Extremities."
3:30-4:15. Dr. Samuel R. Cunningham: "Treatment of Fractures of the Upper Extremities."
4:15-5:00. Dr. Frederick L. Reichert: "The Helpful Points in the Diagnosis and Treatment of Brain Tumor."
5:00-5:45. Dr. Owen H. Wangensteen: "The Surgery of the Undescended Testis."

Medicine

2:00-3:00. Dr. William Dock: "The Estimation of Myocardial Damage."
3:00-4:00. Dr. Leo G. Rigler: "Roentgen Diagnosis of Heart Disease."
4:00-5:00. Dr. Walter M. Simpson: "Undulant Fever."
5:00-6:00. Dr. Cyrus C. Sturgis: "Diagnosis and Treatment of Myxedema."

Otolaryngology

10:00-12:00 } Special for Otolaryngologists.
3:00- 5:00 } Dr. Robert E. Ridpath: Review of Rhinolaryngology.

SATURDAY, JUNE 27

MORNING MEETINGS

8:30-9:30. Dr. Arno B. Luckhardt: "High Lights and Shadows in the Discovery of General Anesthesia." (Illustrated.)
9:30-10:30. Dr. Dean Lewis: "Vascular Lesions of the Extremities."
10:30-11:30. Dr. Charles R. Austrian: "Empyema."
11:30-12:30. Dr. Leslie T. Webster: "Resistance of Infectious Disease."

AFTERNOON MEETINGS

Surgery

2:00-2:45. Dr. A. Elmer Belt: "Urinary Afflictions of Childhood."
2:45-3:30. Dr. Leo Buerger: "The Surgical and Medical Treatment of Renal Infection."
3:30-4:15. Dr. Samuel R. Cunningham: "Treatment of Fractures of the Lower Extremities."
4:15-5:00. Dr. Frederick L. Reichert: "The Treatment of Peripheral Nerve Injuries."
5:00-5:45. Dr. Owen H. Wangensteen: "The Surgery of Carcinoma of the Stomach."

Medicine

2:00-3:00. Dr. William Dock: "Cardiac Medication in Theory and Practice."
3:00-4:00. Dr. Leo G. Rigler: "Benign and Malignant Tumors of the Stomach."
4:00-5:00. Dr. Walter M. Simpson: "A Correlation of the Clinical and Pathological Concepts of Hyperthyroidism."
5:00-6:00. Dr. Cyrus C. Sturgis: "Various Methods in Use in the Control of Edema."

Otolaryngology

10:00-12:00 } Special for Otolaryngologists.
3:00- 5:00 } Dr. Robert E. Ridpath: Review of Rhinolaryngology.

MEDICAL NOTES

OREGON

ALPHA OMEGA ALPHA LECTURE. The annual lecture sponsored by the Oregon Chapter of Alpha Omega Alpha will be delivered on the evening of May 18 in the Auditorium of the Medical-Dental Building, Portland. The speaker will be Dr. Richard B. Dillehunt, Dean of University of Oregon Medical School, who will discuss the subject, "Anterior Poliomyelitis." All physicians of the Northwest are invited to be present.

TUBERCULOSIS HOSPITAL AT SALEM. Plans were approved last week by the state board of control for a state tuberculosis hospital at Salem. The unit will be of concrete construction and will have complete hospital facilities. It will be three stories in height and will occupy thirty-six by one hundred sixty-eight feet land area. The total cost will be $90,000.

Revised Plans for Emanuel Hospital at Portland call for two additions instead of one. The maternity addition, four stories high and providing seventy beds, will be located on the south side of the present structure, while the addition on the north end will provide twenty additional beds. An expenditure of about $200,000 is anticipated.

Pendleton Physician Appointed Member of State Board. Dr. Joseph P. Brennan has been appointed a member of the state board of health to succeed the late Dr. W. T. Phy of Hot Lake. Dr. Brennan served in 1930 as president of Eastern Oregon Medical Society.

The Portland Academy of Medicine was addressed at its regular meeting April 22 by Dr. Franz von Groer, professor of pediatrics at the University of Lemberg, Poland.

Dr F. E. Fowler of Astoria is on an extended trip to the East, during which he will take a postgraduate course in New York surgical clinics.

Dr. M. L. Handshuh of Eugene has recently been arrested and charged with practicing medicine without a license. He was appointed to the state chiropody examining board last year by Governor Norblad.

Dr. C. E. Hardwick, graduate of the University of Oregon Medical School, is locating for practice in Lakeview, to be associated with Dr. H. E. Kelty.

WASHINGTON

The Tacoma Surgical Club held its annual session April 18 with upward of two hundred surgeons from the entire Northwest in attendance. Traumatic and industrial surgery were thoroughly discussed in their various aspects. Dr. Harry Mock, associate professor of surgery at Northwestern Medical School, was the guest of honor. He delivered an address, "Bad Results in Industrial Surgery," in addition to two other discussions. The following program of papers was presented: Dr. H. J. Whitacre, "Problems of Traumatic Surgery;" Dr. Edwin C. Yoder, "Compression Fracture of the Spine;" Dr. Ralph C. Schaefler, "Chest Injuries;" Dr. L. L. Goodnow, medical director, state department of labor and industries, "Wrist Fracture Reduction and Retention;" Dr. Hiram S. Argue, "Injury of the Urethra;" Dr. Charles S. Pascoe, "Injury of the Kidney;" Dr. S. F. Herrmann, "Abdominal injuries;" Dr. H. G. Willard, "Peripheral Nerve Injuries;" Dr. A. C. Stewart, "Neuroses, Psychoses and Dishonesty."

Medical Library Incorporated. The Spokane County Medical and Dental societies recently filed incorporation papers in Olympia for the establishment of a medical and dental library. They claim one of the finest collections of medical and dental books in the Northwest. Dr. R. N. Hamblen is chairman of the committee. Miss Leila Lundy is librarian.

New Hospital Trustee Law Pinches. The law passed by the last legislature placing the control of county hospitals of more than 200-bed capacity in the hands of a board of trustees, is causing some commotion in Pierce county. To keep the number of patients under the 200 maximum, a number of patients have recently been discharged or transferred to other buildings and the result has been considerable publicity concerning the hospital.

New Head For County Infirmary. Dr. C. L. Moad of Fairfield has been appointed by Spokane county commissioners to take charge of the county hospital and infirmary at Spangle. He takes over the duties formerly under the direction of Dr. W. M. Newman, county physician and health officer.

Cowlitz County Medical Society met at Longview Tuesday, April 14, at a dinner meeting. It was addressed by Drs. O. S. Proctor and A. H. Peacock of Seattle and Dr. A. E. Anderson of Aberdeen, president of the state association.

Lewis County Medical Society held its monthly meeting April 13 at St. Helens Hotel, Chehalis, at which time they were addressed by Dr. I. R. Watkins of Aberdeen on the general subject of fractures. Dr. O. R. Austin of Aberdeen read a paper on goiter.

Snohomish County Medical Society was addressed at its April Meeting in Everett by Dr. H. T. Rhodes of that city. He recently completed a postgraduate course at Bordeaux, France. Dr. D. G. Dickerson, Seattle neurologist, read a paper on therapeutic diagnostic nerve block.

Yakima County Medical Society held a meeting at Yakima, April 13, at which Dr. R. C. Coffey of Portland discussed "The Field of Usefulness of Gauze Drainage and the Quarantine Pack in Abdominal and Pelvic Surgery."

Pierce County Medical Society has inaugurated a series of advertisements on health and is running them in the local newspapers. The object of the campaign is to acquaint the public with the aims, objects and capabilities of the legitimate medical profession. The advertisements as they appear seem to be well worth while.

Medicolegal Practice Assailed. Dr. Milton G. Sturgis, has recently asked the Seattle Bar Association to work for the appointment of a commission of impartial experts to pass on all medicolegal evidence in Washington courts. He claims that the present situation is unsatisfactory to the best men in both medical and legal professions.

Director of Maternity and Child Hygiene. Dr. J. Warren Bell of Everett is leaving for Olean, N. Y., to take a position as director of maternity and child hygiene with the demonstration health unit of Cataraugus county.

Medical Radio Station Ordered. Establishment of a radio station in the Port Angeles Marine hospital to furnish medical advice to vessels in North Pacific and Alaska waters was recently announced by Public Health Service officials.

Dr. Thomas Douglas of Seattle has returned home after more than a year devoted to study in Vienna, where he resided with his family. He made a special study of eye, ear, nose and throat work, to which he will devote his practice in the future.

Dr. P. J. Gallagher, who has practiced in Spokane for the past twenty years, has moved his office to Seattle, where he will assume his duties as medical director of the New World Insurance Company. His work in Spokane is being taken over by Dr. J. C. Bunten.

Dr. J. W. Doughty, who for the past twenty-five years has been officially connected with state hospitals for nervous and mental diseases, has located for practice in Seattle. During the greater part of this period he has been superintendent at the hospital at Sedro-Woolley. His practice will be limited to diseases of the nervous system.

Doctor Returns After European Trip. Dr. Frederick Falk of Seattle has recently returned from an extensive postgraduate course in European centers, Vienna, London and Berlin. At this time he is limiting his practice to ophthalmology.

Dr. R. E. Mosiman has sailed from Seattle with his family for Naples, Italy, via Panama Canal. He will go to Vienna where about four months will be devoted to the study of pathology.

IDAHO

New Veterans' Hospital. A Veterans' hospital to cost $225,000 is virtually assured in the near future to be built at Boise. Congress has appropriated funds for the hospital and the plans are being drawn in Washington.

Announces Heads at Institutions. Dr. C. R. Lowe of Boise was appointed superintendent of the state hospital for the insane at Blackfoot. Dr. D'Orr Poynter has been reappointed to the Nampa home for the feeble-minded and Dr. J. T. McKelway has been reappointed as head of the Orofino asylum.

Dr. G. H. Cooper has returned to Burley after a protracted stay in a coast hospital. He expects to take up his practice in Jerome in the near future.

Dr. E. O. Jones of Dubois has gone East for postgraduate work in Chicago.

Dr. W. R. Hamilton of Weiser was recently appointed a member of the state medical board by Governor Ross.

OBITUARIES

Dr. Gershom L. Closson, Seattle, Wash., died March 30 after an illness of several months from intestinal carcinoma, aged 57 years. He graduated from the University of Vermont Medical School in 1904. After practicing a year at Wakefield, Mass., he located in Seattle in 1906, where he engaged in general practice. After taking up special study in 1924 he devoted his practice to dermatology.

Dr. Thomas B. Holder, aged 76, died March 12 at his home at Preston, Idaho, following a heart attack. He was born in Missouri in 1855. He was graduated from the Missouri Medical School of St. Louis in 1882. Previous to his arrival in Franklin county in 1917 he was connected with the Utah Copper Company at Bingham, Utah.

Dr. Ira E. Barrett died at St. Vincents hospital, Portland, March 27 after a several weeks illness of diabetes, aged 45 years. He was born at Hillsboro. He graduated from the University of Oregon Medical School in 1912. He practiced formerly at Dufur and moved to Willamina in 1930, practicing medicine in this community until February, 1931, when he located at Nehalem.

Dr. Willard O. Dutton, The Dalles, Ore., died at the age of 68 years at Crate's Point, March 3. He was born at Fond du Lac, Wis., in 1862. He located at Spokane, Wash., in 1889 and moved to The Dalles in 1908. He practiced in this community for the past forty years, retiring three years ago. He graduated from Jefferson Medical College in 1889.

REPORTS OF SOCIETY MEETINGS

OREGON

POLK-YAMHILL-MARION COUNTIES SOCIETY

Pres., R. L. Wood; Secty., W. W. Baum

The monthly meeting of Polk-Yamhill-Marion Counties Society was held at Dallas, April 7. About seventy-five were present from the three societies. A dinner preceded the medical meeting.

Dr. W. F. Patrick of Portland discussed "Diseases of Bone," illustrated by x-ray slides.

Dr. W. H. Barendick of McMinnville read a paper on "Spinal Anesthesia."

PORTLAND COUNTY AND CITY MEDICAL SOCIETY

Pres., N. W. Jones; Secty., H. P. Rush

A meeting of Portland City and County Medical Society was held at the Auditorium of the Medical-Dental Building, April 15.

Dr. Ralph M. Dodson presented "Case Reports of Postoperative Cases." This was discussed by Drs. J. E. Else, Dean Seabrook, E. W. St. Pierre and W. B. Holden.

Dr. Blair Holcomb read a paper, "Blood Sugar Curves in Thyroid Patients." This was discussed by Drs. I. C. Brill, C. E. Sears, J. R. Montague and E. L. Boyden.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the Auditorium of the Medical-Dental Building, Seattle, April 6, president R. J. McCurdy in the chair. Minutes of the meeting of March 2 were presented.

Colonel H. V. Wurdemann, Flight Surgeon U. S. A., read a paper, "Medical Examination of Aviators, Including Neuropsychiatry and Personality Tests." By comparison with other modes of transportation he considered the airplane is a comparatively safe method of travel. He described the requirements and details of examination applied to air pilots, showing that it is a most exhaustive and detailed process of eliminating the unfit. He gave a practical demonstration on Dr. Louis Maxson of the routine examination of applicants.

First Lieutenant Edwin D. Warren, Flight Surgeon, U. S. A., read a paper, "Brief Resume of Tests for Vision and the Schneider Cardiovascular and Circulatory Index." Details of this examination were outlined with an explanation of their application.

Dr. A. W. Howe of Tacoma gave a paper, "Tests for Equilibrium with Remarks on Its Use in General Practice, the Barany and Douching Tests." An explanation was presented of the caloric test for equilibrium as well as the turning test. The comparative value of each was explained with significance in pathologic conditions. Motion pictures were presented showing the reactions in a normal individual.

Dr. R. W. Perry gave a description of the organization of the air service in Seattle during the war.

Dr. D. J. Thorp explained the action of the Metropolitan Building Company in accepting certain tenants in the Brooklyn Building.

Dr. Conner Gray gave a report of the activities of the ethics committee. On motion of Dr. Morcom it was voted a statement be included in the telephone directory, stating that Main 6901 is the official physicians' telephone exchange. Dr. H. C. Olmsted made a report of a recent meeting of the library committee with recommendation that the same be presented for consideration before the Society. Plans of cooperation were suggested but no definite action taken.

Applications for membership were received from Drs. W. H. Brandt and W. B. McKibben.

The medical section of the society held its monthly meeting April 13, with Dr. D. H. Nickson in the chair. Dr. John E. Guberlet, Professor of Zoology, University of Washington, read a paper, "Pandemic Parasites of Man in the Northwest." The parasite most commonly encountered is entameba histolytica. The cystic stage only is active in producing the disease in man. Intestinal flagellates were described. Trematodes were mentioned, the different kinds being specified. There was also a discussion of the cestodes.

Dr. Earl R. Norris, assistant professor of chemistry, University of Washington, presented "A Report of Original Research on the Action of Vitamin B." He described the discovery of this vitamin, the results of its deficiencies and the means of counteracting these.

PIERCE COUNTY MEDICAL SOCIETY

Pres., D. M. Dayton; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held April 14, in the auditorium in the Rhodes Medical Arts Building, Tacoma.

Drs. W. C. Cameron and C. Grant Bain were unanimously elected members of the society and Drs. Charles C. Adams and Delmar Goode, United States Veterans Hospital No. 91, were granted associate membership.

The program was given over to a consideration of the protection of Tacoma's milk supply and was opened by a discussion by Dr. S. M. Creswell, City Health Officer, who gave a review of contagious diseases in the city of Tacoma for the last eleven years, with tables giving total number of cases and mortality.

The second paper was "The Present Standards of Tacoma Milk Supply in Relation to Tuberculosis," by Dr. James McGavick, City Veterinarian. He reviewed the control of tuberculosis in cattle in Pierce County during the last several years. He stated that at the present time all raw milk sold in the city of Tacoma is from nonreacting cows and less than 1 per cent of all the milk sold in Pierce County is from reactors. He said the milk in Tacoma averages eight to nine thousand bacteria per cc., which is greatly under the average city count.

Mr. J. L. Marstrand, of the Grand Pre Dairy, talked on "The Problem of Control of Epidemic Abortion in Cattle." He has the honor of having the first herd of dairy cattle in the state of Washington to be granted a state certificate of freedom from abortion. He explained how he had accomplished this.

Dr. J. W. Kalkus of the Western Washington Experiment Station, spoke on "Undulant Fever; What the State of Washington is doing to Remove Sources of Infection." He stated that the State of Washington is examining all cattle upon request, but there is no compulsory control of this disease.

The program was completed with a paper, "How the Dairy Protects Tacoma's Health," by Mr. Bert Sweeting, Bacteriologist for the Medosweet Dairies, who described the inspection and care which the large dairy uses to insure pure milk supply.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Secty., G. C. Daniels

Walla Walla Valley Medical Society held its regular monthly meeting at Walla Walla, April 9. Thirty-five were in attendance.

Dr. J. M. Blackford of Seattle gave an address on "Hypertension: Its Dangers and Treatment."

Dr. C. J. Johannesson read a paper on "Intravenous Urography By Use of Uroselectan."

WHITMAN COUNTY MEDICAL SOCIETY

Pres., J. L. Gilleland; Secty., A. K. Harris

The annual meeting of Whitman County Medical Society was held at Colfax, April 15.

The following officers were elected for the ensuing year: President, A. T. Lukins, La Crosse; Vice-President, E. K. Wolfe, Palouse; Secretary-Treasurer, P. G. Weisman, Colfax.

An interesting program was presented at which the following papers were read:

"Impetigo Contagiosa," Dr. D. T. Ford, Pullman.

"Nephritis, following Measles. Case Report." Dr. P. G. Weisman, Colfax.

"Papillocarcinoma of Urinary Bladder. Case Report." Dr. A. K. Harris, Colfax.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Modern Methods of Treatment. By Logan Glendening, M. D.,; Professor of Clinical Medicine, Lecturer on Therapeutics, Medical Department of the University of Kansas, etc. With Chapters on Special Subjects by Drs. H. C. Anderson; J. B. Cowherd, H. P. Kuhn; F. C. Neff; E. H. Skinner; E. R. de Weese; and Carl O. Bickter, M.G. Cloth, 818 pp. $10.00. Fourth Edition. The C. V. Mosby Co. St. Louis, 1931.

Treatises devoted exclusively to medical treatment have flourished from time to time in the past and the fact that the present work is in its fourth edition shows it possesses more than ephemeral value and interest. Some two decades ago Forcheimer's book on Prophylaxis and Treatment of Internal Disease had a wide circulaton and following, going through many editions. His special claim for recognition was that the book represented the end-result and boiled down experience of thirty years in private and hospital practice. In the present volume we find about half devoted to the description of therapeutic agents and measures, while the latter part is given to the treatment of specific diseases.

In one way this simplifies matters for the author in not having to repeat himself in different parts of the book. Thus in the treatment of decompensation he simply mentions the use of digitalis and one may refer back to the general subject of digitalis therapy for particular details. This complicates matters for the reader, however, in having to consult various parts of the volume when interested in only one subject. This salyrgan is also advocated under the same head, in the treatment of edema with decompensation, and one must consult another part of the book to find the details of the use of this agent.

Under the head of transfusion the author presents a paragraph on the comparison of the direct and citrate methods of blood transfusion which should have been of great value if he had truly presented the pros and cons of both sides. He writes, "The citrate does usually cause a reaction—a chill and slight shock." This is not the case, or has not been in the reviewer's experience, and when the expense and technical difficulties of the direct method are contrasted with the ease and simplicity of the citrate method, there is but one possible conclusion to be drawn. The author quotes Unger that the citrate method should be abandoned. In the great clinics, where transfusions are done several times daily, the direct methods are abandoned, as they should be in private practice. Any properly trained doctor can perform a citrate transfusion unassisted, in his office if need be, and the difficulties and expense of the direct method prevent thousands of transfusions which are daily demanded.

Under the treatment of purpura hemorrhagica the author states that "blood transfusion is the only treatment of value." Leading authorities everywhere have found that splenectomy is the treatment of choice in this disease, when bleeding is excessive and in chronic and recurrent forms of the disease. In the treatment of angina pectoris the author regards euphyllin as the most successful drug but does not mention theobromin which by most clinicians has been found of chief value. Neither does he note the recent use, in the last few years, of paravertebral injections of novocaine and alcohol which have had such miraculous effect in relieving anginal pain over long periods in the most intractable and unbearable cases.

As a whole, the general description of the more important principles and details of medical treatment is reliable and conforms to the best modern therapy, although not so good as found in the text of books devoted to treatment of special diseases. It would seem better had the author confined himself wholly to therapeutics, or entirely to treatment of internal diseases, instead of combining the two subjects in one volume. WINSLOW.

THE CRIMINAL, THE JUDGE AND THE PUBLIC. A psychological Analysis. Franz Alexander, M. D., Visiting Professor of Psychoanalysis at the University of Chicago and Hugo Staub, Attorney at Law, Berlin, Germany, 238 pp. $2.50. The Macmillan Company, New York. 1931.

A physician and a jurist endeavor in this book to utilize psychoanalytic knowledge in an attempt to gain an understanding of the criminal personality. The authors are convinced that the criminal is as legitimate an object for psychologic investigation as is the neurotic or the normal individual. The book is divided into two parts. Part one deals with the problem of crime in the light of psychoanalytic theory and treats such topics as the battle for justice, the crisis of present day justice, the role of psychology in the understanding of the criminal, criminality as a general human manifestation, etc.

The authors make the following statement: "We agree with Williams when, in agreement with so many other prominent psychiatrists, he states that the judge of today is incapable of understanding the personality of the criminal, and yet the understanding of the personality is absolutely necessary for a just verdict. We believe, however, that the psychiatrist of today is also incapable of such understanding unless he is trained along the lines of deeper psychology." Further on the following statement is made: "The psychoanalyst cannot be satisfied with the formal psychiatric statement that this and that case is a 'psychopathic personality,' and yet the older type of psychiatrist can do little more than make this statement; the psychoanalyst cannot be satisfied with the latter because he can go further and point out the important and specific phychologic mechanisms which are hidden behind these too general scientific designations."

In the chapter on criminality as a general human manifestation, there is another interesting statement: "The majority of criminals are not different physically and grossly psychologically from the normal individual; the deviation from the normal is a matter of development, which depends more on the life history of the person than upon heredity; in other words, the greatest number of criminals could under different circumstances have developed into normal individuals." The chapter dealing with the problem of responsibility and the role of medical expert opinion in the Court is so extremely instructive and interesting that it needs to be read in its entirety to be appreciated.

The closing chapters of the book deal with a detailed account of several criminal cases as approached by the psychoanalytic technic. All of them sound very plausible, if one is to believe the interpretations placed upon them. The question naturally occurs whether all analysts would be in accord in their interpretation of these various phenomena. The whole book is very readable and furnishes food for the thoughtful who are interested in the question of crime and its social consequences. Certainly our present methods, both legal and psychiatric, have contributed very little towards its solution or prevention. ROHWER.

HIGH FREQUENCY PRACTICE, with Appendix, for Practitioners and Students. By Burton Baker Grover, M.D., President of the Western School of Physical Therapy, etc. Illustrated with Engravings, Thoroughly Revised and Rewritten. Sixth Edition. 625 pp. $7.50. The Electron Press, Kansas City, Mo., 1931.

This volume is authoritative on the subject of high frequency practice on account of the standing of the author and his wide experience in the practice of physical therapy. For an understanding of this agency one needs information in the fundamentals of the electric current in its various physical phases. This information is obtainable from the early chapters, in which are dscussed new physics and magnetism. To the inexperienced the high frequency current is much of a mystery. The author clarifies this subject in a manner that will satisfy the reader, when dealing with physics of high frequency currents. The principles of medical diathermy and electrosurgery are presented in detail.

The practical application of diathermy with various forms occupies about half the volume, the different organs of the body being considered in order and the diseases to which they are subjected. The application of this agency is considered in each of these. The chapter on blood pressure is worthy of any one's consideration. The author states that hyperpiesia is capable of relief by the high frequency current, combined with other therapy and thereby may avert hypertension and other circulatory pathology. By means of this agency relief may be obtainable in many conditions of disease resistant to ordinary methods of treatment. Diathermy is a useful agency in many of the specialties. Its application to many conditions are given in detail without undue statements as to results obtainable. Information on many of these subjects is imparted in chapters dealing with specific diseased conditions. The author is conservative in suggested treatment and the reader can depend on the accuracy of the therapy outlined.

Roentgen Interpretation, A Manual for Students and Practitioners. By George W. Holmes, M. D., Roentgenologist to the Massachusetts General Hospital, etc., and Howard E. Ruggles, M. D., Roentgenologist to University of California Hospital. Fourth Edition, Thoroughly Revised. Illustrated with 237 Engravings. 339 pp., $5.00. Lea & Febiger, Philadelphia, 1931.

The appearance of the revised fourth edition of this work is in itself a testimonial to its value. Chapters I and II, on confusing shadows and artefacts and anatomic variations and development, serve as a useful and almost necessary prologue to the practical chapters which follow. Chapter IV, on bone pathology, is sufficiently detailed to furnish, together with the first two chapters, a foundation for the other decidedly practical chapters on interpretation, seven in number, which are found in the book.

These seven chapters on fractures and dislocations, the skull, the spine, joints, tendons and bursae, the chest, the gastrointestinal tract, the genitourinary tract, cover in a very practical way essentially all the conditions ordinarily encountered by the general practitioner. The final chapter, on fluoroscopic technic, is good, both as to description of necessary apparatus and protective measures to be used. The description of fluoroscopic technic is clear and ample for instruction of anyone attempting radiologic work.

This volume should prove of great value to everyone called upon for interpretation of roentgenograms. In all, it is eminently practical, sufficient in detail and well arranged for quick use. The bibliography at the end of each chapter affords ample opportunity for investigation by the more advanced roentgenologist. Bourns.

The Principles and Practice of Perimetry. By Luther C. Peter, A. M., M. D., Sc. D., F. A. C. S., Professor of Ophthalmology in the Graduate School of the University of Pennsylvania, etc. Third Edition, Thoroughly Revised. Illustrated with 194 Engravings and 5 Colored Plates. 315 pp., $4.50. Lea & Febiger, Philadelphia, 1931.

The relation of disturbances of the visual fields to ocular lesions and to central nervous system is known to the general profession as well as the specialists. Perimetry diagnosis, however, and the data furnished in its finer determinations, are not generally carried out as they should be, even by ophthalmologists. While this is a subjective elicitation of conditions, yet it is so exact that it furnishes a definite localization for the lesion. Wherever diminution of visual acuity or suspicion of any central disease is had, perimetry charts, not only of the full field, but of the central portion should be made.

This third edition has been enlarged by descriptions of the more exact projection of the retinal fibres along the visual pathway and a more accurate standardization of equipment and technic, a clearer conception of the fields in glaucoma, toxic amblyopia, a broader knowledge of the field changes in diseases of the nasal accessory sinuses, a clearer appreciation of the differentiating significance of optic neuritis, papillitis and papilledema, the bearing of perimetry on cerebral localization and a newer conception of visual field changes in the amblyopia of squint. The greatest change in this edition is found in the recording of fields by the more correct anatomic or physiologic method.

The work is well printed, bound, and illustrated, with full bibliography, the latter classified under anatomic and physiologic headings. The index is sufficiently exhaustive. This work is recommended as the standard text on perimetry for the last decade. The monograph is offered with the added hope it may awaken the profession to the realization of the great value of perimetry in the practice of ophthalmology in neurology and neurosurgery.

Wurdemann.

Legal Medicine and Toxicology. By Ralph W. Webster, M.D., Ph.D., Late Professor of Medicine (Medical Jurisprudence) in Rush Medical College, University of Chicago, Chicago, Ill. 862 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $8.50.

A single volume of legal medicine and toxicology now takes the place of the former two volumes of the same subjects and by the same author. The last half of the book covers in an admirable manner the subject of toxicology. It is technical and, by taking advantage of several revsions and information gained from court reviews, every word and sentence packs a statement that is scientific, legal and will withstand a legal assault. The first part of the book covers a multitude of medicolegal subjects. The chapter on wounds is admirable. Malpractice is covered in a practical way and should be read by every practiticing physician. Mental disorders in their medical relations is an interesting and instructive chapter. There are important chapters on the legal rights and obligations of physicians, identification of the living and the dead, death in its medicolegal relations, death from asphyxia, cold, heat and starvation, death from burns, scalds, lightning and electricity. Due attention is paid to examinations of blood stains, impotence and sterility, pregnancy, birth, abortion, infanticide and rape. The book occupies leadership in its field. There is no scientific book dealing in medical questions that is more often quoted in our courts and is used as a basis for medicolegal argument. Copps.

Selections from the Papers and Speeches of John Chalmers DaCosta, M.D., LL.D., Samuel D. Gross, Professor of Surgery, Jefferson Medical College, Phila., Pa. 440 pp. Cloth, $6.50. Philadelphia and London; W. B. Saunders Company, 1931.

This book contains papers and speeches on various surgical subjects, largely of a historical nature. The author tells of the practice of surgery of a hundred years ago, and amplifies on its teachers from that time to the present era. It represents the evolution of aseptic surgery, presented as only a scholar could describe it. The language is beautiful, the history is fascinating, and the characters are graphically painted, as only a word artist like the author could portray them. Baron Larrey, Surgeon General of Napoleon's armies, Paris during the reign of Louis Philippe, the early hospitals and surgeons of Philadelphia, the rise

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of Jefferson Medical College, are a few of the subjects covered. Throughout the sketches are instilled the author's subtle wit and sagacious philosophy. This book can well be read with pleasure and inspiration by any medical man, and in particular, the younger doctors who are looking forward to the practice of surgery. It should be in every surgeon's library. Leibly.

Traumatotherapy. By John J. Moorhead, B. Sc., M. D., F. A. C. S., Professor of Surgery and Director, Dept. of Traumatic Surgery, New York Post-Graduate Medical School and Hospital; Surgical Director, Reconstruction Hospital Unit; Colonel Medical Officers Reserve Corps, U. S. Army. 574 pages with 625 Illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $7.00.

Care of the injured is fast becoming one of the most important problems of the modern practitioner. This book deals with all phases of traumatic surgery, from the simplest wound to the most accepted method of reduction of fractures. It is concise, well written, and is a valuable addition to the library of any general practitioner. The author does not attempt to give all possible methods of treatment of wounds or fractures but clearly explains the most accepted methods. It is well illustrated and briefly outlines the medicolegal aspects of the treatment of injuries.

Jared.

A Textbook of Laboratory Diagnosis. With Clinical Applications for Practitioners and Students. By Edwin E. Osgood, M. D., Assistant Professor of Medicine and Biochemistry, Director of Laboratories, University of Oregon School of Medicine, Portland, Ore., and Howard D. Haskins, M. D., Professor of Biochemistry, University of Oregon School of Medicine. With Twenty-one Figures in the Text and Six Colored Plates. 475 pp., $5.00. P. Blakiston's Son & Co., Inc. Philadelphia, 1931.

This book is divided in two parts. Part One considers that knowledge which practitioners must have at the bedside in order to make a diagnosis so that the treatment will not do harm. Because the diagnosis is wrong the treatment may do little or no good and even do much harm, at least may delay recovery. In Part Two the methods of making the laboratory examinations are given with special emphasis on the running of controls and the common mistakes in technic to be avoided. So frequently the physician and especially the surgeon takes the signed report of the technician as a solemn laboratory finding, little realizing that personalities, errors in observation, technical difficulties, reagents that have deteriorated, etc., all go into the making of that report.

The authors try to show the display of ignorance by such absurd requests as for a "complete blood count," or a "complete blood chemistry." The laboratory examinations which the physician can conscientiously recommend are those which he (still possessed of his own knowledge of the disease and of the tests available) would want done on himself, were he in the patient's physical, economic and social position and were he required to pay the price expected of this patient for this quality of laboratory work.

The book is an excellent reminder of the valuable laboratory work which can be done to help in the diagnosis and treatment of disease. It also points out in no small way the useless and expensive work frequently requested by doctors who do not realize the limitations of the data which laboratories give to them. Mosiman.

Infant Feeding in General Practice. By J. C. V. Braithwaite, M.D., M.R.C.P. (Lond.), Physician in Charge of Children Out-patients, Leicester Royal Infirmary and Children's Hospital, etc. With a foreword by H. C. Cameron, M.A., M.D. (Cantab.), F.R.C.P. 144 pp. $1.75. William Wood & Co., New York, 1930.

This is a very concise and practical exposition of the elements of infant feeding in a plain and readable style. The first third of the book is given over to breast feeding and the author extorts its value over artificial feeding. Many practical suggestions are given for the solution of the difficulties arising from breast feeding. The middle third of the book is devoted to artificial feeding, this exposition being very practical and technicalities carefully avoided. The last third of the book deals with nutritional disorders. Here the author adhers to the German and Austrian ideas of pathogenesis and treatment, and discusses the various conditions simply and practically. This text is an admirable epitome on the subject of infant feeding and is especially interesting because written by an Englishman from an English pediatrician's point of view. C. L. Smith.

Practical Dietetics for Adults and Children in Health and Disease. By Sanford Blum, A.B., M.S., M.D., Head of Department of Pediatrics and Director of the Research Laboratory San Francisco Polyclinic and Postgraduate School. Fourth Revised and Enlarged Edition. 380 pp., $4.00. F. A. Davis Company, Philadelphia, 1931.

The author states that a correct dietary from a medical standpoint should be of such a nature that the patient can and will follow it. Moderation in the application of restrictions will prove most advantageous. Since digestibility of the food is preliminary to success the digestive system must be taken into consideration. Part I deals with dietary for adults in health and disease, the latter listed alphabetically from acidosis to vomiting in pregnancy. There is a brief dietary discussion of each disease considered. Then follows "type meals" with foods listed, "may eat, avoid." It is noticed that quantities and calories are not specified. Part II in the same manner deals with dietary for infants and children in health and disease. These dietaries have striven for simplicity and clearness, as stated by the author.

Incidence of Brain Tumors in Epilepsy. Nicholas Gotten, Philadelphia (*Journal A. M. A.*, April 4, 1931), presents three cases of brain tumor, disclosed in the routine encephalographic studies made on fifty-six epileptic patients in whom the only prominent symptoms were convulsions. One of the cases had been diagnosed as idiopathic epilepsy, one as post-traumatic (operative) jacksonian epilepsy. The proportion of unsuspected focal lesions in this sort of condition is therefore 5.3 per cent. The beneficial results of early recognition and removal of the tumor is evident and the use of encephalography as a diagnostic procedure is of great value in establishing the characteristics and pathologic changes associated with convulsive seizures. In each of the cases presented, convulsions were the initial symptom; in two cases, clinical neurologic signs were not sufficient to establish the presence or localization of brain tumor, and as there were no signs of generalized intracranial pressure there appeared to be no reason for suspecting such lesions. The use of encephalography for diagnosis and localization of organic lesions of the brain is therefore of great value. When properly undertaken with due regard to technic and contraindications, it is a safe and justifiable procedure attended with little risk.

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ACHLORHYDRIA

PRACTICAL CONSIDERATION OF ITS CLINICAL SIGNIFICANCE *

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The absence of free hydrochloric acid in the gastric content is expressed by one of the various terms such as "anacidity," "achylia," "achlorhydria" and "achylia gastrica." The last term was coined by Einhorn[1] in 1892, and implied not only absence of free hydrochloric acid in the gastric juice, but of the ferments rennin and pepsin as well. To what extent this appellation is necessary remains to be seen. It was introduced at a time when basic considerations of activity of enzymes were wanting, and quantitative estimations of proteolysis were crude and inaccurate; when erroneous conceptions of the pathology of gastric glandular disease and atrophy persisted, and undue significance was attached to the lack of free hydrochloric acid. In addition, the absence of such means of diagnostic refinement as the fluoroscope, cholecystogram and calorimeter; failure to employ such secretogogues as the alcohol, histamine, and bouillon test meals; failure to employ fractional analysis of gastric content and lack of means of estimating hydrogen-ion concentration limited the diagnostic horizon and clinical application of earlier investigation. As a result, an apparently deficient gastric secretory status, that actually might be normal for a given patient, or that might be of an abnormal, transient nature, was regarded as a clinical entity. Often it was an expression of functional, systemic, endocrinous derangement, of disease of the accessory digestive tract, or of a circumscribed, organic gastric lesion, difficult of detection before the advent of roentgenoscopy or without surgical exploration. Nevertheless, the term achylia has persisted in medical literature, and, as a rule, with erroneous significance if the strict sense is desired. For the foregoing reasons the expression achlorhydria is preferred and will be so used throughout this paper for the sake of clarity.

Many methods have been advanced for quantitative determination of peptic activity, ranging from the simple, crude, Mette tube method to the rapid and presumably accurate methods of Gates,[2] as modified by Gilman and Cowgill,[3] which involves the digestion of the gelatine layer of a photographic film. Quantitative estimation of ferments is beset by many difficulties, and, as Northrup[4] has shown, it is necessary to discard methods based on previous procedures. At any rate, heretofore, data derived from quantitative estimation of peptic activity have not, as a rule, played an important diagnostic

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* Read before the Eighth Annual Meeting of Pacific Northwest Medical Association, Butte, Mont., July 1-3, 1930.

[1] Einhorn, Max: On Achylia Gastrica. Med. Rec., 41: 650-654, June 11, 1892.

[2] Gates, F. L.: A Method of Proteolytic Enzyme Titration. Proc. Soc. Exper. Biol. and Med., 24:936-937, 1926-1927.

[3] Gilman, Alfred and Cowgill, G. R.: The Determination of Peptic Activity: An Examination and Application of the Gates Method of Proteolytic Enzyme Ttration. Jour. Biol. Chem., 88:743-752, Oct., 1930.

[4] Northrup, J. H.: The Dynamics of Pepsin and Trypsin. Harvey lectures, 26:36-76, 1925-1926.

part in American gastroenterologic practice. Faber[5] has maintained that complete cessation of gastric secretion of acid, as well as pepsin, does not obtain, and his observations are supported by those of more recent investigators. Some authorities, such as Boas,[6] Hirsch-Mamroth and Rindfleisch[7] and Franke,[8] have expressed the view that determinations of peptic activity permit of differential diagnosis between achylia gastrica on the one hand, and gastritis, as well as functional anacidity, on the other.

Polland and Bloomfield,[9] after using a modified edestin method of theirs, felt that the estimation of pepsin might turn out to be a more delicate index of gastric injury in certain types of cases than is determination of acidity. Similar and more extensive investigation by them and by other workers is essential in order properly to evaluate the method before adopting quantitative determination of peptic activity as a routine in laboratory procedure. In my judgment, the usual methods of analysis of gastric content always will play the major diagnostic part, largely because of their simplicity and universal application, and because, since pepsin cannot be activated in the absence of hydrochloric acid, low peptic activity invariably will be associated with achlorhydric states. When quantitative estimation of peptic activity can actually be made, the terms hyperpepsinia, hypopepsinia and apepsinia may be used.

PATHOGENESIS OF ACHLORHYDRIA

Agreement as to the etiologic factors concerning this subject in all its phases is not universal. Important investigations in this respect already have been completed, and are still under way, the results of which, coupled with advances in knowledge of the physiology of gastric secretion, undoubtedly will clarify the situation. Fenwick,[10] in 1877, was the first to discover gastric atrophy in association with severe anemia. Nine years later, Cahn and von Mering[11] were the first to notice the absence of free hydrochloric acid in cases of pernicious anemia. The view became general that complete absence of this acid was due to atrophy of the glands, and thus was of serious import. It was not until fifteen years after Fenwick's work that Einhorn showed that the condition may exist over a long period of time without terminating fatally, and that it may be present without giving rise to gastric disturbances.

German contemporaries of Fenwick advanced the pathologic conception of phthisis ventriculi or magenatrophie, but Welch[12] subsequently maintained that its existence as a primary or independent disease had not been proved. Faber stated that it is a disease which depends on exogenous factors (hematogenous, toxic) and that it develops from gastritis. By gastritis he did not necessarily mean an inflammatory condition, but, as Fenwick held, a functionally deranged and disordered glandular mechanism, somewhat akin to the general conception of nephritis and hepatitis. The hereditary and familial aspects of both achlorhydria and pernicious anemia, and the causative relation of the former to the latter, have been studied by various authors, including Hurst[13] and Conner,[14] and seems definitely established. Izod Bennett and Ryle,[15] in an examination of the gastric content of apparently healthy young adults, found that 7 per cent gave evidence of subacidity, and 4 per cent of achlorhydria. Hurst stated that 16 per cent of the latter would eventually have pernicious anemia.

The absence of free hydrochloric acid, as disclosed even by the fractional method of analysis, is common in the experience of one who reviews many thousand analyses of gastric content annually. In the absence of any noteworthy symptoms and signs, and of positive results of roentgenoscopic examination, achlorhydria by itself, in many instances, has no real clinical significance. In such cases modern tests of the ability of the stomach to secrete hydrochloric acid would show that this function was still present in the majority. To what

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5. Faber, Knud: Chronic Gastritis, Its Relation to Achylia and Ulcer. Lancet, 2:901-907, Oct. 29, 1927.

6. Boas, I.: Eine neue Methode der Pepsinbestimmung im Mageninhalt. Deutsch. med. Wchnschr., 1:511-512, 1925.

7. Hirsch-Mamroth and Rindfleisch, Hermann: Ergebnisse der Magensaftuntersuchung mit der neuen Pepsinbestimmung nach Boas. Deutsch. med. Wchnschr., 1: 512-513, March, 1925.

8. Franke, K. F.: Ueber Pepsinbestimmungen mit der Methode von Boas, speciell nach Alkoholprobefrühstück. Deutsch. med. Wchnschr., 1:275-276, Feb., 1927.

9. Polland, W. S. and Bloomfield, A. L.: Quantitative Method for Estimation of Pepsin. Jour. Clin. Invest., 7:45-55, April, 1929.

10. Fenwick, Samuel: Atrophy of the Stomach. Lancet, 2:1-4, 1877.

11. Cahn, A. and von Mering, J.: Die Sauren des gesunden und kranken Magens. Deutsch. Arch. f. klin. Med., 39:233-253, 1886.

12. Welch: Quoted by Henry, F. P. and Osler, William: Atrophy of the Stomach, with the Clinical Features of Progressive Pernicious Anemia. Am. Jour. Med. Sc., 91:498-511, 1886.

13. Hurst, A. F.: The Pathogenesis of Subacute Combined Degeneration of the Spinal Cord, with Special Reference to its Connection with Addison's (Pernicious) Anemia, Achlorhydria and Intestinal Infection. Brain, 48:218-232, June, 1925.

13. Hurst, A. F.: Precursors of Carcinoma of the Stomach. Lancet, 2:1023-1028, Nov. 16, 1929.

14. Conner, H. M.: Hereditary Aspect of Achlorhydria in Pernicious Anemia. J. A. M. A., 94:606-611, March 1, 1930.

15. Izod Bennett, T. and Ryle, J. A.: Studies in Gastric Secretion. V. A Study of Normal Gastric Function Based on the Investigation of 100 Healthy Men by Means of the Fractional Method of Gastric Analysis. Guy's Hosp. Rep., 71:286-318, July, 1921.

extent, in such cases, there will eventually be serious permanent secretory derangement and departure from health has for a long time been a clinical problem, to the solution of which present investigation is also directed. In another group, however, without demonstrable gross gastric disease, the gastric glandular structure is of markedly impaired function, as evidenced by low secretory volume and low acidity, both before and after stimulation with histamine. In this group, on the basis of former, yet reliable clinical criteria, the gastric content was of small amount, poorly chymified, of low total acidity, often contained an admixture of thick, glairy, tenacious mucus, and, of course, dimethylaminoazobenzol gave no evidence of the presence of free hydrochloric acid. Persons with these signs may present one of a variety of complaints which presently will be described.

Gastritis in one of its various forms, especially chronic gastritis, is in my opinion a common cause of hypochlorhydria and of achlorhydria; the importance of this has been underestimated in recent decades. The whole subject has been well summarized by Rehfuss[16] in his textbook. Important, and now familiar, contributions in this respect have been made by Hayem,[17], Faber, Konjetzny[18] and Hurst. I am in accord with all their conclusions, with the possible exception of that which concerns the part that chronic gastritis plays as a precursor of ulcer and of carcinoma. Pathologic research in this field has been beset with difficulties, for achlorhydria and gastritis are not inconsistent with a fair degree of health or even with longevity. Moreover, the rapid postmortem autolysis and putrefaction of the gastric and enteric mucosa are prevented only by prompt recourse to a preservative injected intraperitoneally, or introduced directly by tube into the stomach. In life many of the handicaps are now largely overcome by use of the gastroscope for purposes both of research and clinical work. The use of this method was demonstrated by the Germans in their observations on the unfavorable effect of the Kriegsdiät on gastric mucosa.

ACHLORHYDRIA IN GENERAL MEDICINE

In general, it may be stated that gastric achlorhydria is found in febrile conditions (even though it may be temporary under such circumstances); in chronic wasting, metabolic, constitutional and endocrine diseases; in states of general debility and chronic infection; in disturbances of the autonomic nervous system; in arteriosclerosis and in senility. Dedichen[19] showed that 66 per cent of the inmates of institutions for the aged poor in Sweden, from sixty-seven to ninety-two years of age, had achlorhydria. This secretory status is frequently associated with general constitutional asthenia and is an index of poor physical fitness. Psychoneurotic persons may give evidence, at various times, of absence of free hydrochloric acid, of the presence of normal concentrations of it or of excessive amounts of it. This fluctuation in values is termed "heterochylia."

The commoner causes which may operate to produce achlorhydria, or that may be associated with it, are gastric carcinoma, gastric syphilis, chronic cholecystic disease, pernicious anemia, chronic alcoholism, subacute combined sclerosis, chronic infection of the upper part of the respiratory tract, oral sepsis, pregnancy, hyperthyroidism, myxedema and tuberculosis. It is common in sprue and pellagra, especially in advanced stages of the disease. Achlorhydria is also found often enough in certain other conditions to make a direct relationship plausible. Such conditions are migraine, allergic state and cutaneous disease, such as acne rosacea and scleroderma. Those who have investigated large series of cases of chronic arthritis have shown that achlorhydria and hypochlorhydria are five times as commonly seen among these patients as among normal subjects, but in only slightly greater proportion than among patients with other diseases. Chronic arthritis is more often associated with achlorhydria than with sepsis. Nonarticular fibrositis diverges still more from the normal, by a higher incidence both of achlorhydria and of hyperchlorhydria.

The possible significance, and the potentialities for future mischief, of absence of free hydrochloric acid from the stomach should make the condition as interesting to the internist as to the specialist in diseases of the digestive and biliary tracts. The gastroenterologist who would disregard the probable causative factor of achlorhydria in the presence of chronic diarrhea would be as derelict of his duty as the internist who would disregard persistent lienteric diarrhea as a probable complication of previous gastrojejunostomy. To the gastroenterologist, achlorhydria conjures up the possibility of carcinoma, gastrocolic fistula, gastrogenic diarrhea or anorexia nervosa; to the internist, subacute combined sclerosis, pernicious anemia, neurasthenia, and a type of secondary anemia reported by various observers and termed "achylic chloranemia" by Kaznelson[20] and his collaborators, and the "hemoglobin dysfunction type" by Watkins.[21] At any rate, as well as with the well-known pernicious anemia, the physician may anticipate, with a fair degree of certainty, deficient gastric secretory function in association with certain clinical conditions, most of which already have been mentioned.

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[16] Rehfuss, M. E.: Diagnosis and Treatment of Diseases of the Stomach. Philadelphia, W. B. Saunders Co., 1927, pp. 473-500.

[17] Hayem: Quoted by Rehfuss.

[18] Konjetzny, G. E.: Die chronische Gastritic des Ulcusmagens (Zur Beurteilung des Operationsanzeigen und der Operationserfolge beim Magen-Duodenalgeschwür). Zentralbl. f. Chir., 50:1026-1028, June 30, 1923.

[18] Konjetzny, G. E.: Bemerkungen zu vorstehenden Aufsatz. Deutsch. med. Wchnschr., 55:958-959, June 7, 1929.

[19] Dedichen, Lucien: Anacidity in Old Persons. Acta Med. Scandin. Suppl., 7:345-350, 1924.

Christian[22] has emphasized the fact, too, that there are a number of conditions that can be said to be related to each other on the basis of the presence of achlorhydria. He felt that they constituted a family group or a family tree of diseases. This led him to review, in a comparative way, certain diseases in which achlorhydria is found, and to group them on the basis of this and some other changes that are commonly present or absent in pernicious anemia. He expressed the view that, whatever view one holds with regard to achlorhydria, its very constant presence in pernicious anemia cannot be without significance and should be looked on as a potential evil. This viewpoint, along with the contentions of Faber, Hurst and others that achlorhydria bears a causal relationship to pernicious anemia, was justified by the important researches of Castle[23] and his associates, which directly led to the use of preparations of whole gastric mucosa of hogs in the treatment of pernicious anemia.

ACHLORHYDRIA IN GASTROENTEROLOGY

Since chemical analysis of aspirated gastric content is the usual and rational method of determining the presence or absence of achlorhydria, a brief consideration of the scope of the ordinary test meal is not amiss. That its value taken by itself, in diagnosis, has been overrated in the past there is no doubt. On the other hand, it has been underrated to the extent that physicians have been enjoined to discard it as a routine. But the fact remains that invariably data concerning the secretory and motor functions of the stomach, and concerning the presence or absence of abnormal elements, are accessory and frequently essential to successful diagnosis and treatment. With the old method of single aspiration, achlorhydria was noted in about 7 to 15 per cent more cases than with the fractional method now used. Therefore, the latter method is one of the means whereby many of the cases of so-called false, spurious or apparent achlorhydria are recognized and eliminated. Bloomfield and Keefer[24] have pointed out the inadequacy, in their opinion, of even fractional analysis. They adopted a procedure which made it possible to estimate, under uniform conditions and with reasonable accuracy, the acidity of the undiluted gastric juices, the volume of secretion and the emptying time of the stomach. Although they have conclusively pointed out the shortcomings of the ordinary test meal, it is my belief that their procedure is too time-consuming as a routine for use in a laboratory, although in doubtful cases, or for research purposes, it would prove advantageous.

As far as laboratory data go, we have found adequate as a basis for decision in certain clinical conditions, consistent achlorhydria as revealed by fractional analysis after a test meal, combined with roentgenoscopic study of the progress of an opaque meal. Whenever it is desired, fractional analysis is repeated after use of such secretogogues as histamine, bouillon or the meat meal. There may be the greatest variation in gastric secretory function in anatomic disease of the stomach, ranging from the achlorhydria of benign gastric tumor, with addisonian-like anemia, to the hyperchlorhydric state occasionally seen in gastric carcinoma. As a matter of fact, the gastric content in 46 per cent of our verified cases of gastric carcinoma contained free hydrochloric acid, as determined by the ordinary methods of titration. Other factors or combinations of factors, in conjunction with achlorhydria, such as fresh, altered or occult blood, or gastric retention, may far outweigh in diagnostic importance any data concerning purely the secretory gastric function, particularly if these data are obtained by a procedure too elaborate and time-consuming to permit of application as a routine in clinical practice.

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20. Kaznelson, P., Reimann, F. and Weiner, W.: Achylische Chloranamie. Klin. Wchnschr., 8:1071-1074, June 4, 1929.

21. Watkins, C. H.: A Classification of Chronic Idiopathic Secondary Anemia. J. A. M. A., 93:1365-1366, Nov. 2, 1929.

22. Christian, H. A.: The Achlorhydria Family Tree of Diseases. N.W. Med., 24:531-535, Nov., 1925.

23. Castle, W. B.: The Aetiologic Relationship of Achylia Gastrica to Pernicious Anemia. Proc. Roy. Soc. Med., 22:1214-1216, 1929.

23. Castle, W. B. and Locke, E. A.: Observations on Etiological Relationship of Achylia Gastrica to Pernicious Anemia. Jour. Clin. Invest., 6:2-3, Aug., 1928.

24. Keefer, C. S. and Bloomfield, A. L.: The Significance of Gastric Anacidity. Bull. Johns Hopkins Hosp., 29:305-329, 1926.

24. Bloomfield, A. L. and Keefer, C. S.: Clinical Studies of Gastric Function. J. A. M. A., 88:707-711, March 5, 1927.

24. Bloomfield, A. L. and Keefer, C. S.: Gastric Acidity; Relation to Various Factors such as Age and Physical Fitness. Jour. Clin. Invest., 5:282-294, Feb., 1928.

Consistent achlorhydria, exclusive of the hereditary form, is almost constantly associated with, and largely confined to, such conditions as pernicious anemia, subacute combined sclerosis of the spinal cord, with or without anemia, chronic alcoholic and atrophic gastritis, chronic gastroenteritis from whatever cause, the late stages of sprue, diffuse or advanced cases of carcinoma and gastric syphilis. The achlorhydria following total or subtotal gastrectomy might be regarded in the same light as a form resulting from experimental conditions. In gastroenterologic practice, the achlorhydria associated with gastric carcinoma, especially the advanced form of gastric carcinoma, and with many cases of chronic alcoholic gastritis is commonplace. Of great clinical interest and importance, as Hamburger[25] has pointed out, are those cases of achlorhydria in which the symptoms simulate peptic ulcer. Those cases of so-called gastrogenic diarrhea are equally familiar; the abnormal physiologic function underlying the frequent movements of the bowels is not clear.

Another interesting group, to which Plummer[26] has called attention, is that in which the presenting symptoms are those of chronic cholecystic disease of mild to moderate degree. The patients in such cases have lowered basal metabolic rates, invariably are without clinical evidence of hypothyroidism, are of artistic temperament as a rule, tend to become fatigued readily, and have vascular hypotension. Experience with these patients has taught that removal of the gallbladder is contraindicated, especially in the presence of a negative cholecystogram, and that better results can be obtained by medical treatment, on a broad, somewhat individualized basis, for such patients are fundamentally of constitutional physical inferiority. To what extent there is a greater tendency to disease of the gallbladder in such cases remains to be seen.

In the days before competent roentgenoscopic examinations were a routine, the patient with chronic dyspepsia, with marked deterioration in health, and with achlorhydria due to cholecystic disease, was sometimes erroneously believed to have a gastric carcinoma. Cholecystic disease, with achlorhydria, and with pyloric obstruction as the result of extensive adhesions, although of less frequent occurrence, likewise resulted in the diagnosis of carcinoma of the stomach. Achlorhydria was present in 85 per cent of the cases of gastric syphilis recently reported by me,[27] but gross retention was present in less than one-fourth. Achlorhydria, with retention of food for nine to twelve hours after a Riegel meal, is such a reliable clinical criterion of gastric carcinoma that, if a roentgenologic diagnosis of a benign pyloric or duodenal lesion has been made, under such circumstances, it can, with the rarest exception, be refuted without fear of embarrassment. In such cases there are usually other earmarks of serious gastric disease, either from the standpoint of anamnesis, general appearance and nutritional status of the patient, or from that of the results of general examination. Any small, obstructive, juxtapyloric lesion, without an obvious gastric filling defect, might be labelled duodenal ulcer with obstruction, even by the most astute roentgenoscopist, because 90 per cent of all such obstructive lesions are caused by duodenal ulcer. However, the clinician has definite evidence of its malignant nature. It is to be remembered that occasionally there may be complete absence of free hydrochloric acid in the gastric content of the ulcer-bearing patient at the initial examination, even when it is done by the fractional method; this may be the result of psychic inhibition.

Chronic cholecystic or pancreatic disease, or both, especially the former, should first be excluded in cases in which there is a chronic, recurrent, distressing or painful epigastric attack, associated with achlorhydria, and if there are no demonstrable clinical or roentgenologic signs or symptoms of a gastroduodenal lesion. In a recent series seen at the clinic, of 2,290 verified cases of cholecystic disease not associated with peptic ulcer, diabetes or pernicious anemia, in 15.33 per cent achlorhydria was discovered by fractional analysis. There was only a negligible difference between the cases in which calculi were found, and those in which they were not. Hartman and Sager,[28] in a series of 492 patients with anacidity, found that 18 per cent had cholecystic disease. In a series of 420 patients with hypochlorhydria, sixty-seven (16 per cent) had disease of the gallbladder. Gatewood,[29] in reviewing 192 cases of diseased gallbladder, found achlorhydria and hypochlorhydria in a total of 45 per cent.

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[25] Hamburger, W. W.: Achylia Gastrica. Med. Clin. Chicago, 2:691-705, Jan., 1917.

[26] Plummer, H. S.: Personal communication to the author.

[27] Eusterman, G. B.: Gastric Syphilis. Observations Based on Ninety-three Cases. J. A. M. A., 96:173-179, Jan. 17, 1931.

[28] Hartman, H. R. and Sager, W. W.: Statistical Study of Diagnostic Anacidity. Med. Jour. and Rec., 124:96-97, July 21, 1926.

[29] Gatewood: Achlorhydria in Gallbladder Disease. J. A. M. A., 81:904-906, Sept. 15, 1923.

ACHLORHYDRIA AND CHRONIC PEPTIC ULCER

The corrosive action of the gastric juice in the etiology and symptomatology of gastric and duodenal ulcer has been a matter of much controversy. Protagonists of the theory that the corrosive action is of significance, among whom Sippy was the outstanding American representative, emphasized, among other factors, (1) the presence of an adequate amount of secretion and of acidity in uncomplicated benign, chronic peptic ulcer, especially during the symptomatic phase, and (2) control of characteristic distress or pain by adequate neutralization of the free hydrochloric acid. The whole subject has been more recently reviewed by Palmer.[30] His conclusions in the main seem to be justifiable. Only rarely is an ulcer associated with constant achlorhydria, especially during the time of characteristic distress. In addition to control of symptoms, neutralization of the free hydrochloric acid also promotes healing, as proved in clinical cases and by experiments on animals. If adequate neutralization is achieved, and the characteristic symptoms persist or recur in the course of a period in which neutralization is being maintained, one should infer that the lesion is malignant, complicated by another condition or nonexistent. Therefore, it may be said, in general, that the association of active, benign ulcer of the stomach or duodenum, with constant achlorhydria, is rare, after a standard test meal has been given and the usual methods of titration have been employed; when achlorhydria persists, under such circumstances, the clinician should exercise the utmost care, both in the diagnosis of ulcer and in recommendations as to the nature and extent of treatment.

In the presence of a roentgenologic diagnosis of gastric or duodenal ulcer and achlorhydria, the latter verified by at least two complete fractional analyses of gastric content, the clinician must make sure that there is no associated constitutional disease, such as pernicious anemia, or an intraabdominal condition, such as chronic cholecystitis. He must consider the possibility of carcinoma, syphilis and tuberculosis, especially if the lesion is in the stomach. Such possibilities are less remote, if the lesion or deformity visualized is situated in the first portion of the duodenum. Under the circumstances, the deformity may be due to extrinsic causes, which are infrequent, or the lesion may be a healed one. Naturally, the clinician must also think of possible erroneous roentgenologic diagnosis. Healed lesions in the duodenum are not uncommon, judging from my experience, and from the pathologic studies of Robertson and Hargis.[31] This is the more likely if achlorhydria is present. The visualized lesion may have little bearing on the complaint, as illustrated by the following report of a case, one of numerous instances seen annually in a large gastroenterologic experience.

A man, aged twenty-seven years, first entered the clinic March 14, 1928. His appendix had been removed four years previously. For a period of four years he had had discomfort, fullness in the infraumbilical region, rumbling of gas and constipation. He had abused the use of cathartics. The distress appeared soon after meals, or as late as one and a half to three hours thereafter. He had the sensation that the stomach emptied slowly. Rather inconstant relief was obtained by the use of soda or by vomiting which was often induced. The man was of a somewhat asthenic type, inclined to ptosis, with vascular hypotension, malnutrition, a gastric succussion splash, dental and tonsillar foci of infection, achlorhydria, and persistent deformity of the duodenal bulb, characteristic of duodenal ulcer.

The infected tonsils were removed, and treatment for ulcer was instituted. At the end of six weeks there was little improvement. Then a smooth, anticonstipation type of diet was given, together with sedatives, mild digestants, and carminatives off and on; some improvement followed. Reexamination, June 5, 1929, showed persistence of the original symptoms, with increased emesis and loss of weight. Eleven days later, posterior gastrojejunostomy was

TABULATION

Fractional analyses of gastric content in case reported.

Date	Stimulus	Titrations (intervals of 15 min*)	Titrate cc.
March 16, 1928	Test meal	20 20 16 24 0 0 0 0	88
March 19, 1928	Histamine	5 8 8 20 29 34 23 0 0 0 5 15 19 8	149
March 24, 1928	Breakfast	28 40 44 50 50 10 20 22 30 30	105
March 27, 1928	Test meal	10 10 10 10 0 0 0 0	65
April 25, 1928	Test meal	18 16 16 14 4 0 0 0	50
June 6, 1929	Test meal	34 16 Bile ++	70
January 9, 1930	Test meal	16 18 16 18 0 0 0 0	95
September 8, 1930	Test meal	14 16 14 14 0 0 0 0	60

*Total acidity, upper line; free hydrochloric acid, lower line. Quantities given are as of 100 cc. of gastric content and indicate end points in terms of cubic centimeters of tenth normal sodium hydroxide.

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[30] Palmer, W. L.: The Mechanism of Pain in Gastric and in Duodenal Ulcer. Arch. Int. Med., 39:109-133, Jan., 1927.

[31] Robertson, H. E. and Hargis, E. H.: Duodenal Ulcer: An Anatomic Study. Med. Clin. N. Amer., 8:1065-1092, Jan., 1925.

done, and a small, healed scar on the anterior wall of the duodenum and a moderately dilated, thin-walled stomach, was found. A short period of relief was followed in two weeks by a "load in the stomach," gas and constipation. Basal metabolism was normal. There was no response to treatment by Koehler's extract of the cortex of the suprarenal gland.

April 24, 1930, correspondence revealed that relief had not followed the operation, the symptoms had persisted, and June 21, 1930, the patient reported that there was much vomiting of food, with admixture of bile soon after eating; the retention type of emesis was not in evidence. Diet was markedly reduced voluntarily. Examination, September 8, 1930, disclosed that there were more gas and pain immediately after eating. Vomiting had increased. Blood pressure was low. Achlorhydria was present. Judging from roentgenologic examination, the opening made at gastroenterostomy was functioning normally. Addison's disease and pernicious anemia were excluded.

When the patient was given a diet high in vitamines and calories and low in residue, in addition to insulin, ventriculin, sodium *iso*amylethyl barbiturate (amytal), sodium cocodylate intramuscularly and reassurance, all symptoms became controlled, and he gained in weight. Relapse occurred a few weeks after he returned home. The diagnosis was constitutional physical inferiority. Results of various analyses of gastric content are given in the tabulation.

The symptoms of ulcer can be faithfully mimicked by a diseased gallbladder, even to hemorrhage, and since more than 15 per cent of such conditions are associated with achlorhydria, this possibility must be borne in mind, especially in the absence of roentgenologic signs of ulcer. Moreover, in a condition already mentioned, an achlorhydric state in itself may give rise to a train of symptoms recembling those of ulcer.

On the other hand, about 4.5 to 5 per cent of all proved chronic benign gastric ulcers may be associated with achlorhydria as disclosed by analysis of gastric content done as a routine. This is a rather consistent percentage from year to year. The majority of the patients are elderly men, usually with marked dental or other foci of infection. The lesions tend to penetrate through the coats, and often give evidence of "protected" perforation at operation. Hemorrhage is frequent; apparently there is a small group of active gastric and duodenal ulcers, especially the former, with rather consistent hypochlorhydria, even achlorhydria. These ulcers are perhaps indolent, often arteriosclerotic, and do not go on to healing in spite of a favorable chemical background.

The importance of acid gastric juice to the etiology of peptic ulcer seems to be evident in the clinical fact that a gastrojejunal ulcer is never seen in the presence of actual achlorhydria, nor after resection for gastric carcinoma, when the preoperative examination revealed subacid or anacid gastric content. In the presence of deformity of the duodenal cap, if the symptoms and other features tend to suggest that an uncomplicated duodenal ulcer is present to the exclusion of other conditions, and if there is persistent achlorhydria, any recommendation for operation should be made with extreme caution. The results are usually disappointing, and unless some other concrete pathologic condition is found, the state of the patient after operation may be worse than before. It is often necessary to take down a gastroenterostomy to relieve diarrhea or marked intestinal distress which may have developed after operation. Pyloroplasty is the best procedure, when it is feasible, if operation is undertaken.

TREATMENT

With the possible exception of that group of cases which simulate ulcer, there is no proof that any symptoms referable to the stomach proper are due to achlorhydria by itself. Of course, the lack of acid may give rise to diarrhea, anemia and changes in the spinal cord. As in chronic alcoholism, such symptoms as cardialgia, eructation and vomiting, and the production of mucus may be due to gastritis. In the absence of gastritis, the majority of symptoms are of neurogenic nature. In treatment, all recent workers have emphasized the importance of adequate amounts of dilute hydrochloric acid. Dobson[32] made an extensive investigation of the benefits that might be derived from treatment with hydrochloric acid and pepsin. He felt that patients with complete achlorhydria should be persistently and adequately treated with dilute hydrochloric acid. The fact that symptomatic relief does not always accompany the treatment, even with the induction of apparently adequate acidity, is not necessarily a contraindication to the continued use of the acid, he maintains, since its digestive, antiseptic and other influences may still be effective.

The value of treatment can be determined by periodic investigation with the tube and test meal or with histamine, whether free acid has been actually produced during digestion, or whether there is any indication of reactivation of the secretory mechanism by spontaneous production of free acid. Of course, such treatment should necessarily be supplemented by such important general measures as adequate rest, diet and whatever other measures seem indicated. This form of treatment may be replaced by the superior, although more expensive, forms of ventriculin or its equivalent.

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[32] Dobson, H. V.: Achlorhydrias. A Consideration of the Benefits from Treatment with Hydrochloric Acid and Pepsin. Jour. Pharmacol. and Exper. Therap., 30: 447-488, April, 1927.

The so-called gastrogenic type of diarrhea usually has responded promptly and effectively to treatment with acid. There is usually not only fairly prompt cessation of the diarrhea, but general gain in weight, and in nervous and physical energy. Some authorities advocate giving alkalies several hours after meals during periods of treatment, for the continued use of large amounts of a mineral acid may be followed by untoward systemic results. Patients whose oral mucous membranes are intolerant of acidulous food and drink usually cannot tolerate the treatment with hydrochloric acid. Paradoxic as it may seem, English workers have called attention to the fact that when symptomatic relief in patients who display anacidity is not obtained by treatment with acid, alkalies often produce marked benefit. The addition of pepsin does not seem to be essential. The secondary forms of anemia associated with achlorhydria are most successfully treated with massive doses of ferric citrate, Blaud's pills or extract of fetal liver of calves. A diet adequate in vitamines, proteins and calorie requirements is an obvious complement.

Hurst maintained that achlorhydria is not a result of gastric carcinoma, but of chronic gastritis preceding it, and that the latter is the most common predisposing factor. He maintained that about 75 per cent of all gastric carcinomas were secondary to chronic atrophic gastritis, and considered the prophylaxis, diagnosis, prognosis and treatment of the latter. He recommended gastric lavage with 1 pint (500 cc.) of water to which 1 fluid ounce (30 cc.) of hydrogen peroxide had been added. It will be seen that achlorhydria is representative of one of a number of conditions, functional and organic, and that under certain circumstances it is of diagnostic, therapeutic and prognostic import.

HEART BEAT AND RESPIRATION IN TOTAL NOVOCAINE ANALGESIA [*]

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PART I

The arachnoid system consists of a communicating network of canals, ventricles and penetrating channels, surrounding and permeating the brain and cord. The surrounding spaces are the subdural and arachnoid. The internal spaces are the first, second, third and four ventricles, the aqueduct of Sylvius and the central canal of the cord. The choroid tufts or plexus secrete the cerebrospinal fluid into the leptomeningeal spaces, which liquid traverses and escapes through the pacchionian granulations and villae into the venous channels of the brain and cord. Surrounding each capillary and artery is a paravascular arachnoid space which permits cerebrospinal fluid circulation to bathe the individual cells. To repeat, we have seen whence the cerebrospinal fluid takes its origin, how it percolates through the primitive mesenchymal pathways which originate from cells of the neural crest, and how the pacchionean granulations are outlets for the absorption of fluid into the veins of the brain and cord.[1] This is a short description of the early formation of the third circulation as described by Dr. Weed, and given by Dr. Cushing at the University of Edinburgh in 1925, commemorating the one hundredth anniversary of Majendie's work on the arachnoid system.

The direction of cerebrospinal fluid flow is mainly from above down, but in the central canal of the cord it is from below up. With a change of pressure in the arachnoid of the cord, the direction of flow may be reversed, as in the giving of spinal analgesia[2] (fig. 1).

The ventricular fluid differs chemically from the subarachnoid fluid as follows:

Subarachnoid fluid.	Ventricular fluid.
Total albumin, 30 mg. per 100 cc.	10 mg. per 100 cc.
Globulin, slight opalescence.	Faint opalescence.
Sugar, 45 mg. per 100 cc.	65 mg. per 100 cc.
Urea, 25 mg. per 100 cc.	25 mg. per 100 cc.
NaCl, 730 mg. per 100 cc.	730 mg. per 100 cc.
Lymphocytes, 3 cells per cmm.	0.1 per cmm.

It has been estimated by Pitkin that the cauda equina holds 2 cc., the arachnoid to the first lumbar vertebra 4 cc., to the ninth dorsal vertebra 6 cc., to the sixth dorsal vertebra 8 cc., and that the arachnoid spaces of the cord hold about 20 cc., the cerebrospinal system containing from 100 to 150 cc.

The absorption of drugs as given by Dandy and Blackfan[3] is as follows: Novocaine is found in venous blood at once; in urine in six minutes; in arterial blood in sixty-three minutes, and in lymphatics in one hour and forty minutes. Drugs introduced into the spinal arachnoid may penetrate the

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[*] Read before Tri-County Medical Society, Salem, Ore., June 3, 1930.

[1] Cushing, H: Third Circulation and Its Channels. Lancet 2:851-857, Oct. 24, 1025.

[2] Riquier, C.C. and Ferraro, A.: Circulation of Cerebrospinal Fluid from Standpoint of Intraventicular and Intraspinal Therapy. Jour. Nerv. and Ment. Dis., 64: 561-580, Dec., 1926.

[3] Dandy, W. E. and Blackfan, K. D.: An Experimental and Clinical Study of Internal Hydrocephalus. J. A. M. A., 61:2216-2217, Dec. 20. 1913.

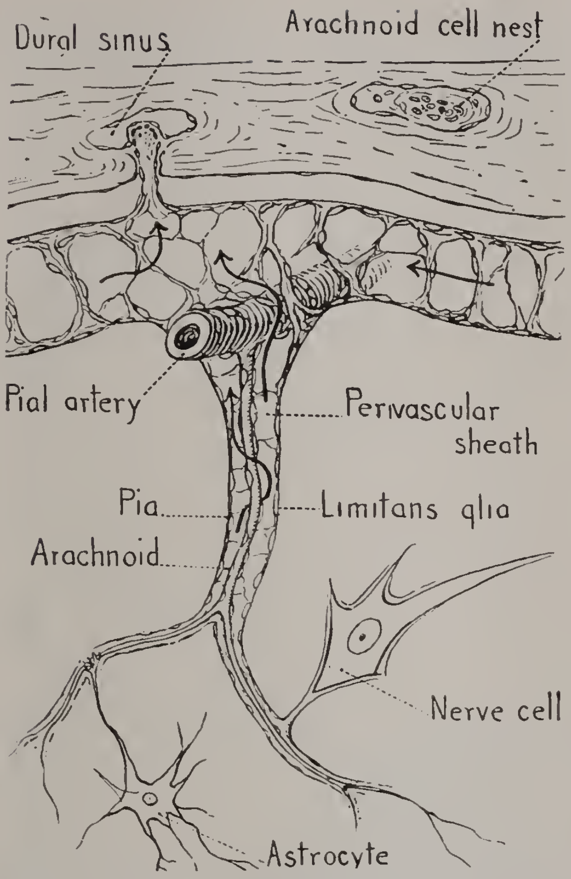

Fig. 1. Diagram to show the sleeve of a pia-arachnoid, constituting the perivascular space surrounding a branch of a pial artery (modified from Weed by Cushing).

cord and ascend through the central canal to the fourth ventricle, or may reach the cerebral ventricles, or be found in the cerebral parenchyma. Drugs may also be absorbed from the perineural spaces and then enter the lymphatics.

LUMBAR PUNCTURE

The ideal posture for technic of lumbar puncture is the recumbent position, with the patient's body slightly but not forcibly flexed. Force is not necessary with most patients, and if they are not held their morale is not broken before operative procedures start. Wrestling holds and force predispose to resistance and lack of cooperation and confidence.

There is plenty of room in the first, second or third lumbar interspace for the needle to pass the midline, if that particular technic is chosen (figs. 2 and 3). It is better to go one-half inch lateral to the midline after anesthetizing the skin and muscles, and insert the needle through the center of the intervertebral opening, as it does not penetrate the superspinous, interspinous and subflavous ligaments, thus avoiding ligamental backache. This technic permits of an easier and a less damaging puncture and a greater percentage of success in spinal administrations. Those who do lumbar punctures will find this method a more suitable technic, a builder of morale for the subsequent operation, and the determining factor in retaining the entire confidence of the patient which is so necessary in all local anesthesia. The lateral recumbency is in great favor, where patients are too sick to sit up or have pain, and where spinal low specific gravity solutions are used when proper painless methods are desired.

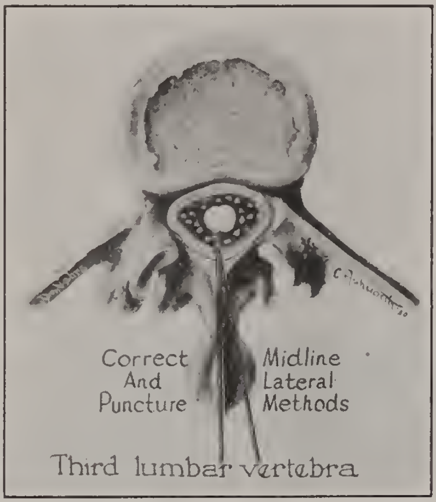

Fig. 2.

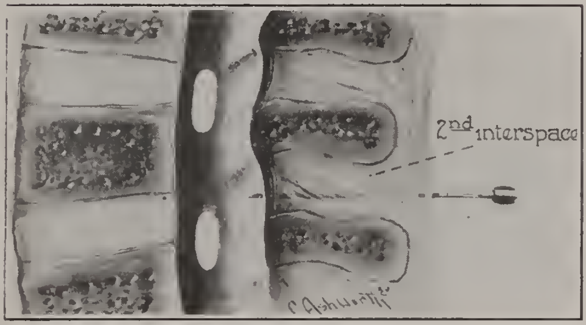

Fig. 3.

PHYSIOLOGIC ACTION OF SPINAL NOVOCAINE ANESTHESIA IN NONLETHAL DOSE

1. Temporary slight irritation to nerve cells.

2. Physiochemical solution of novocaine in the lipoid of the nerve cells.

3. Early paralysis of sensory and later of motor nerve cells and axones.[4] (Very little effect on vital nerve cells and nerves due to special protection

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[4] Dixon, W. E.: The Selective Action of Cocaine on Nerve Fbres. J. Physiol., 32:87-94, 1905.

by lack of affinity and to physical, chemical and automatic protective mechanism.[5])

4. Paralysis of splanchnic nerves with a corresponding drop in blood pressure, due to dilator influence of the parasympathetics through the vagus nerve.

5. Closed hemorrhage into the splanchnic vessels,[6] which can hold all the blood of the body (fig. 4).

6. Anemia of the peripheral circulation and of the brain in the upright and horizontal positions (fig. 5).

7. Stimulation of peristalsis through the vagus nerve.

8. Relaxation of the sphincters.

9. Absolute relaxation of all trunk muscles.

10. Continued motor activity of the cardiac and respiratory centers when under nonlethal doses.

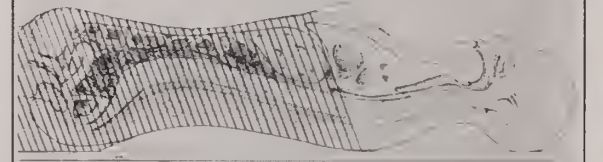

Fig. 4.

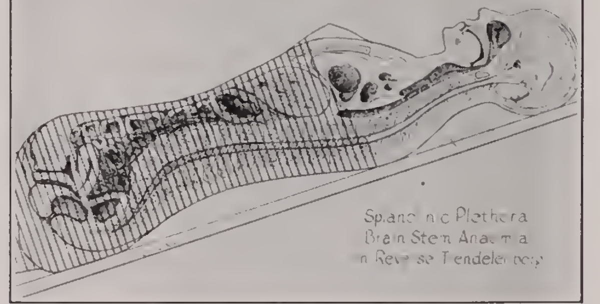

Fig. 5.

Owing to the technic now used, which specifies the foramen for injection in all work on the body when using spinal, the amounts injected, the rates of injection, the measured spinal pressure to allow for better judgment of diffusion level, neck analgesia can be done quite safely.

In the popular second lumbar vertebra technic for total analgesia, novocaine slowly diffuses into the fourth ventricle in the proper concentration for sensory anesthesia and for the continuance of the functions of the vital centers. Thus the vital centers are bathed in a fluid of much less concentration than the lower nerves, which demand greater concentrations for continued analgesia. The vital motor centers are very little affected by these doses of novocaine, thus permitting an unaltered cardiac and respiratory function (fig. 6).

RULES FOR EXPERIMENTAL PROCEDURE ON ANIMALS AND TOTAL ANALGESIA BY NOVOCAINE

Only novocaine to be used. Lumbar and cisterna magna injections. Trendelenberg positions always used after injection of lumbar type and during injection of cisternal type.

INFORMATION DESIRED

1. What is the safe dose of novocaine in the brain stem?

2. What dose of novocaine in the fourth ventricle is alarming in regard to vital function?

3. What dose will completely paralyze?

I wish to give you the early work on animals which is not as yet complete, but which will depict the relationship of results obtained in total analgesia through the lumbar route and in direct cisterna magna analgesia. These experiments were made to establish in the surgeon's mind that (1) there is a safe fourth ventricular dose of novocaine, giving good respiration and good heart action; and (2) that death by novocaine comes in various ways, from brain stem anemia with respiratory failure, paralysis of respiratory nerves and center of heart failure due to heart anemia (fig. 7).

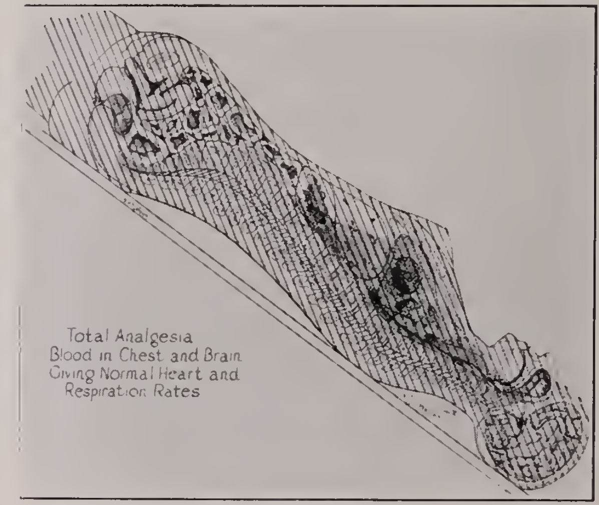

Fig. 6.

By injecting various doses of novocaine in the cisterna magna of animals we found there was a mean dose in the arachnoid system of the brain stem which is safe as regards heart action, respiration and life. After proper novocaine diffusion the

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[5] Koster, H. and Kesman, L. P.: Spinal Anesthesia for Head, Neck and Thorax; Its Relation to Respiratory Paralysis. S. G. and O., 49:617-630, Nov., 1929.

[6] Labot, Gaston: Regional Anesthesia, Saunders & Co., 1928.

Kilograms body weight	Am't of novocaine injected	or of neocain	Sensory block	Motor block	Respiration	Cardiac action	Life
22.50	per cent 15 cc. of 12	per cent	Yes	Yes	None	About 4′ irreg. and fast	Dead
25.60	6 cc. of 6		Yes	Yes	None	About 4½′	Dead
9.00		3 cc. of 9	Yes	Yes	None	3′	Dead
10.00	6 cc. of 3		Yes	Raised up on feet	Altered	Fast and irreg.	Fell dead
10.24	6 cc. of 3		Yes	Raised head	Good 4′	Fast 8′	Dead
37.50		3 cc. of 6	Yes	None	Altered	Fast and irreg.	Life*
Added		2 cc. of 6	Yes	Yes	None	Few minutes	Dead
6.00		2½ cc. of 3	Yes	Could move	Good	Normal	Life*
5.00		3 cc. of 3	Yes	None	Good	Fast, then normal	Life*
7.50		1½ cc. of 6	Yes	No	Altered	Fast, irreg., then good	Life*
10.00	1 cc. of 3		Yes	Could move	Good	Good	Life*
8.00	1.75 cc. of 6		Yes	No	Altered, then normal	Irreg., then good	Life*

Fig. 7. Some experiments on animals to prove the lethal, as well as the safe doses of novocaine, when injected directly in the cysterna magna.

* Cysterna magna injections show there is a sensory block, and in safe dosage little or no motor block. Also that alarming doses cause changes in the heart and respiration, and in these the animal does not move except to breathe because of greater motor block.

safety dose was about 1 per cent with a range of 0.5 to 1.25 per cent. Under .5 per cent muscle movements were possible; over 1.8 per cent death occurred through repsiratory block, followed in three to four minutes by heart failure.

The largest dose of novocaine injected into the cisterna magna directly, with continuance of life, was 4 cc. of 6 per cent solution. This, diluted with the fluid present in the arachnoid, would soon leave a dilution running from 6 to .75 per cent with no doubt a mean concentration of about 1.5 to 1.8 per cent, determined mainly by speed of injection, amount of pressure used and the arachnoid pressure in the cisterna magna. We found that, if 2 cc. of 6 per cent novocaine were added, death occurred at once from respiratory failure. The size of the adult dog is not important; the dose which would kill a small dog would likewise kill a large one. There was one type of dog which seemed most easily killed; that was the bulldog. The reason is conjectural, and is possibly due to a bulldog's habit of setting all muscles firmly and holding its breath, thus raising the cerebral pressure. We all realize high pressures cause a deeper and more rapid anesthesia. These experiments were performed to instil confidence in the surgeon's mind that total lumbar analgesia is, when properly performed, a safe and sane procedure.

In the near future I shall try to complete the experimental work by assaying the amount of novocaine which is present in the cisterna magna five and ten minutes after injection; and also the amounts to be found in the lateral ventricles of the same animal at these same periods. In this way I hope to prove the diffusion rates and the working time dose, together with the lethal dose.

The amount of novocaine which reaches the cisterna magna in patients on the operating table, in whom head and neck analgesia is induced through the second lumbar subarachnoid technic, injecting 6 cc. of .250 mg. of novocaine, is influenced by absorption, dilution, fixation and spinal pressure. The absorption and fixation of the novocaine will account for about .75 per cent. The dilution of the 6 cc. of 3.75 per cent of novocaine used in 20 cc., which is the amount of fluid in the arachnoid of the cord, will bring the percentage of this drug down from 4.16 to 1.25 per cent.

By deducting a possible .75 per cent which is allowed for fixation and absorption, the actual percentage entering the cisterna is found to be about .5 per cent. This percentage of novocaine in the cisterna magna, combined with the amount of spinal analgesia, gives a perfectly safe anesthetic. If, instead of 8 cc., four, five or six cc. of spinal fluid is used with the same amount of novocaine, namely .250 mgs., the diffusion will give the same percentage in the ventricle, if the cerebrospinal pressure is low. By this method of analgesia from one-fifth to one-seventh of the novocaine injected enters the cisterna magna in a slow and regular manner for continued anesthesia of the brain stem.

Using large doses, 4 to 12 per cent in direct cysterna magna subarachnoid anesthesia, the solution enters in a high concentration, rapidly unites with the respiratory and cardiac nerve centers, and the animal at once shows a change of respiration and heart beat. As the novocaine diffuses into the regular amount of cisternal fluid, it dilutes, enabling the respiratory center to continue its normal function. If the final dilution is too concentrated, respiratory and cardiac nerves are paralyzed.

The vital respiratory nerves and center cannot withstand high concentrations because when they are paralyzed automaticity ceases, nerve conduction fails and no impulses are transmitted to the respiratory muscles. Physiochemical stimuli, metabolic activities and the inherent automaticity of the respiratory center are not sufficient, when the center and nerves, afferent and efferent, are paralyzed. The vital heart center is also paralyzed, but the heart action continues as long as nutrient blood is supplied because of the inherent automatic properties of the heart muscle after complete block of its nerves and automatic center by analgesia or otherwise.

RESPIRATION

Respiration is controlled by an inspiratory and expiratory center, situated in the medulla near the calamus scriptorius. Winterstein proved these centers to be rhythmic and automatic, and that rhythmic action currents are to be recorded by a galvanometer under proper conditions of terminal nerve block by curare and severed phrenic nerves; also that, when the respiratory center is destroyed and rhythmic action currents stop, respiration ceases, even though the heart continues to beat and supply blood to the lungs and respiratory muscles.

THE HEART

Hippocrates, Aristotle and Galen, in considering the blood circulation, thought that diastole was the active part of the heart beat. Harvey in 1628 presented to the profession the myogenic automaticity of the heart, described the blood circulation, and proved that systole was the active part of the heart cycle.

Haller believed in the inherent irritability of the heart muscle, and proved in 1757 that, if all the nerves of the heart, afferent and efferent, were severed, it would continue to beat, providing blood containing physiologic food and inorganic salts be continuously supplied to that organ. Since then the medullary centers have been destroyed, the cord cut below the medulla, the heart centers blocked, and the heart continued to function sufficiently to maintain life as long as physiologic food and inorganic salts were continuously supplied. Hence, in order that the heart function properly in total analgesia, the current of analgesic delivered into the fourth ventricle must not be sufficient to paralyze the respiratory center.

The amount of novocaine that is necessary in the fourth ventricle and brain in spinal analgesia to give analgesia sufficient for head and neck surgery by the lumbar route of injection must be between .5 and .75 per cent. This amount in the fourth ventricle in spinal anesthesia will keep the sensory nerves blocked, but will not block the vital motor heart and respiratory nerves.

Operations on humans under total spinal analgesia and on animals under cisterna magna analgesia show (1) that total analgesia by the spinal and cisterna magna route in proper doses permits an unaltered cardiac and respiratory action; (2) that large doses of novocaine in the fourth ventricle or cisterna magna block the cardiac and respiratory centers completely; (3) that death is due to respiratory failure; (4) that the Trendelenberg position is necessary in pure novocaine analgesia in order that the blood will flow by gravity to the heart and permit the automatic heart action to pump that blood to the lungs and brain stem.

CONCLUSIONS

1. The vital motor centers are more resistant to novocaine than are the sensory centers.
2. The vital motor centers can function under proper doses of novocaine delivered to the medulla.
3. Paralysis of the respiratory centers by large doses of novocaine brings about death by respiratory failure.
4. Heart failure may occur, if no blood and physiologic food are delivered to the heart muscle.
5. The actual dose of novocaine in the medulla which will cause alarming symptoms is over 1 per cent.
6. The Trendelenberg position is necessary in pure novocaine analgesia in order that the blood will flow by gravity to the heart and permit the automatic heart action to pump that blood to the lungs and brain stem.

(To be concluded in Part II.)

PHYSICAL EXAMINATION OF AVIATORS

INCLUDING NOTES ON PSYCHIATRY AND PERSONALITY TESTS *

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Twenty-five years ago the ambitions of Icarus, Michael Angelo and our age-old dreams were realized by Lilienthal in taking a heavier-than-air machine on a flutter of a few feet above ground. Then the Wright brothers showed that actual flying was possible. Although we are yet only in the dawn of the air age, a journey by airplane is as safe as crawling over the ground by the rails or gliding over the water by ships; and by miles traveled is five times as safe as by automobile.

There were ten million accidents in the United States last year, in which there were 32,500 persons killed and 960,000 more injured, due to auto vehicles alone, in contrast to but a few dozen by air travel, the latter of which never escape the press in bold headlines. There have been 1365 killed by bullet wounds in the attempted enforcement of the ignoble experimental amendment to our Constitution alone. It is safer to fly than to take a drink nowadays!

Safety in the air, however, mainly depends on the pilot. The licensed, inspected planes are safe, less than 20 per cent of crashes being due to structural defects and more than 80 per cent to physical deficiences or mental aberration of the pilot.

There was practically no selection of the flyer, aside from his personal inclination, in the beginning of aviation. An ordinary physical examination to determine his general condition was the next step. It was then found necessary to make a selection from the personnel before taking up the very expensive training. Even this resulted in a "trial and error" method, causing elimination of the unfit by crashes and fatalities. It was thus found that all men could not fly, that few could become safe pilots, and that some otherwise physically fit persons were unfit for the air.

For the army and navy services, a very exhaustive elimination examination is now required in all countries. The Aeronautics Branch of the Department of Commerce, established some three years ago with a medical section, has a form of examination which is also accepted by most of the States. It requires all candidates, whether for student, private, commerce or transport licenses, to take a physical, mental and personality examination by an appointed graduate flight surgeon, or by certain other physicians, who usually act as a team, who have had more or less training in this new specialty of aviation medicine, on whom the responsibility for selection of the flyer is primarily placed.

Student flyers receive their licenses through the medical examiner before they can even begin training. All flyers submit to an annual examination; the limited commercial and transport pilots have a semiannual in addition. They are directed to report at once to physicians in case of any incidental illness. The army and navy cadets, pilots and personnel, are under constant daily surveillance by the flight surgeon, in order to keep them fit, as there is such a thing as a perfect specimen of humanity having his faculties dulled and "going stale." Such persons, whether in civilian or governmental service, are grounded at once by order of the medical man. This examination is a branch of preventive medicine that saves many lives and much property.

The requirements of the Department of Commerce are not as rigid as those of the services, for civilians are not supposed to indulge in acrobatics and flight formations, and, with the exception of transport pilots, not to do night flying. In addition to our five well known senses, the aviator uses and is dependent upon three more not generally recognized, that of equilibrium, the muscular sense and that of orientation in space.

It is necessary that pilots see well without glasses, for these get lost or soiled. The services demand 20/20 or 100 per cent sharpness of sight. Private pilots must have at least 20/40 or 50 per cent. This cuts out all the myopes and persons whose vision is not normal. All must have good color perception. There must be no tendency to see double and the eyes must not tire easily. They must judge distances correctly and have wide angled visual fields. Hence, the ocular muscles must function normally. They must be able to stand a sudden hop to a mile in the air or a quick drop. Hence, their hearts, circulation, kidneys and lungs must be good, for anoxemia claims its victims. The nervous system must be in fair condition so that they will not freeze on the stick and will react quickly. They should have a certain education,

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* Opening address of a Symposium on Aviation Medicine, King County Medical Society, Seattle, Wash., April 6, 1931.

and above all must be mentally qualified to enter this new domain of the air. This is the physical examination. The other form of selection comes through the instructor during the training period, which is the practical examination, eliminating the remainder of the defectives.

Practically all applicants for civilian flying come up for examination thinking themselves physically fit, but 20 per cent are rejected at once. In case of the services, all candidates have passed the physical examination for admission to the Army or Navy, but only one in ten survives contact with the flight surgeon and the attention of the instructor.

The primary physical examination by the flight surgeon eliminates 30 per cent immediately; 40 per cent are "washed out" during the course of primary field instruction, and half of the remainder fail through developed physical or mental defects or by reason of inability to rate as "good" in the advanced training. In 1930, there were 230 cadets examined for flying training at the U. S. Naval Academy. Of these, 173 passed the flight surgeon, 40 per cent being rejected of these otherwise exceptionally qualified young men.

Aviation is an expensive propostion when figured pro rata, costing the government over $22,000 for each graduate pilot for one year training. The expense for civilian pilots of the schooling alone at the best training centers is: Student or private pilot, 25 hours, $600; limited commercial, 50 hours, $1,200; transport, 200 hours, $4,500.

By this careful selection of the student a high type of aviator was eventuated, making the training nearly as safe as that of the ordinary trades attended by physical risks. For example, in the primary army training school at Brooks Field, there is a record of 48,000 consecutive flying hours without a fatality. The Boeing Airplane Company has completed over 5,000,000 miles of air travel without a single death from accident. Pilot Lee of the Boeing Air Transport has completed over 12,700 hours in the air, covering 1,250,000 miles, without accident or the loss of a letter. Pilot Sam Taylor has flown for more than 12 years, has more than 6,000 flying hours to his credit and has carried more than 150,000 men, women and children, without a scratch or injury to a passenger or himself (table 1).

The writer's experiences with aviation applicants from the Northwest during the World War impressed him with the high standards of their physical qualifications in contrast to those of the drafted selected service men from other sections of America. Men with the most beautiful bodies, modern Apollos, giants in physique, Samsons and Hercules, all from the great West where men are men and women are glad of it. However, it may be that some from the halls of Harvard or the purlieus of Philadelphia will inquire about their brains. Most of them had fair mentality, good enough for army enlisted air men. Sixty per cent of the applicants passed the physical and personality tests at that time.

The requirements of the Aeronautics Branch of the Department of Commerce for a civilian license compare closely as to results in elimination of the unfit with those of the services, bearing in mind that the training of the civilian aviator is for the purpose of safe and sane flying, in contrast to that of the fighter with the necessity for Chandelles, loops, Immelmanns, formations, acrobatics. necessary in combat to close with or to dodge his opponent, one of whom may be elected for a citation by the Angel Gabriel and a pair of personal wings.

With these introductory remarks, I am restricting my discussion to the personality tests and the

Table 1.

MILES FLOWN PER ACCIDENT IN SCHEDULED AIR TRANSPORT OPERATIONS ‡

	Jan.-June, 1928	July-Dec., 1928	Jan.-June, 1929	July-Dec., 1929	Jan.-June, 1930	July-Dec. 1930
Miles flown	4,484,612	6,188,838	9,201,338	15,940,161	16,902,728	20,042,475
Total number of accidents	35	51	61	76	44	47
Miles flown per accident	128,132	121,350	150,842	209,739	384,152	426,436
Fatal accidents	5	7	9	15	6	3
Miles flown per fatal accident	896,922	884,120	1,022,371	1,062,677	2,817,121	6,680,825
Total pilot fatalities	4	5	9	13	5	3
Miles flown per pilot fatality	1,121,153	1,237,768	1,022,371	1,226,166	3,380,545	6,680,825
Total passenger fatalities	3	10	9	9	22	2
Passenger-miles flown	(*)	(*)	(*)	(*)	52,264,616	51,482,633
Passenger-miles flown per passenger fatality	(*)	(*)	(*)	(*)	2,375,664	25,741,316

‡ Air Commerce Bulletin, April 1, 1931.

* Passenger-mile figures not available for this period.

psychiatric examination, leaving the other subjects to the other speakers.

The aviation medical examiner is rarely concerned with high grades of mental disorders, the dementias, manic depressions, pareses, paranoiacs and the mental defectives, as practically all candidates have average mental health. He has to be on his guard particularly for the psychoneuroses, the constitutional psychopathic states and the toxic psychoses, the details of which may not be entered into here.

The time has arrived when the flight surgeon can state with courage his well-founded convictions that certain individuals will or will not be able to qualify as pilots of airplanes. We do this, not only as a result of physical and mental examinations, but also by a form of observation and inquiry which is more or less indirectly used by medical men in examination of their patients, but in which, with the exception of the schools of aviation medicine of the Air Corps, U.S.A., and that of the U. S. Navy, students of medicine and physicians have not been directly instructed, and generally its importance is not realized in the classification, diagnosis and treatment of patients. This is ordinarily called the "personality study."

There are some flight surgeons who have an uncanny ability to prognosticate the physiologic adaptability, but a routine balanced examination is the proper method to bring out the class of the applicant as being qualified or disqualified.

The four large topics about which the information is accumulated are, first, the intellectual activities; second, the somatic demands; the third topic, difficult to characterize, is that embraced by the individual's self-criticism and self-estimate; the fourth is not easily indicated but may be referred to as the urgency or imperative to adaptation. From the temperamental and personality trends we form four general fundamentally inherent types, beginning with that best suited for heavier-than-air craft pilot material:

1. Effective extrovert. These are the sportsmen, the outdoor men, ready for service and quick in emergencies. Even here an individual may have so little analytic attitude that he is dreamy and impractical or he may be so extroverted as to be hypomanic.

2. Effective introvert. These are the intellectuals, well balanced by outdoor proclivities. This may be depreciated by unbalanced artistic trend, uncompensated introversion, which brings the individual nearer the borderline of schizophrenia so that the stress of aviation may push him across.

3. Cognitive extrovert. This is the mixed type of thinking outdoor man. His chances may be spoiled by uncompensated extroversion or exaggerated, unbalanced analytic trend, bordering on the pedantic.

4. Cognitive introvert. These are the true introverts, living in worlds of their own and little affected by outside influences. The possibilities of such a type proving to be safe pilots are meager but, if the introversion is well compensated with some appreciation of the artistic and exceptional intelligence, they may perhaps get by.

Mediocre intelligence in all types abrogates any possibility of safe flying. Aviation is man's latest development and is activated by social dictates. It appeals largely to this side and extroversion supplies the urge for this new means of transportation. We must have people of the sportsman type to fly a ship safely.

There are acquired psychologic inhibitions or characteristics, as complexes, conflicts, anxieties or worries, and modifying factors, such as the degree of self confidence, aggresiveness, courage and attention. The flight surgeon should be able with a few questions, especially the childhood and the school history, family, business and sexual relations, to establish the type of examinee, to judge of his intelligence and the degree of compensation of his inherent trends. The ferreting out of complexes, conflicts, anxieties and worries is a difficult matter but may be elicited by a definite procedure partly during the course of the physical examination. Then, by sitting down and talking to the person, he proceeds to explain that the purpose is to find out whether he will prove a safe flyer, under not only ordinary conditions but in emergencies, and for this purpose he is not approached as if he were a sick man with the idea of bringing out his symptoms, but is examined by a considerable number of questions, which are put in such a manner that they will bring out his reactions. He is informed that some of these questions and remarks are not such as would be used in ordinary conversation or even in a medical examination and that he must not be offended at any; also that any consultation in a doctor's office is confidential and is of no direct interest to the examiner, except for the benefit of the examinee.

For this purpose, we proceed in a definite line, taking up the following studies, for the details of which the time is too limited:

PERSONALITY EXAMINATION

1. Family history.
2. Personal history:
   a. Infantile period.
   b. Environmental factors.
   c. Play life.
   d. Sex life and specific sex demands.
   e. Education, school and college.
   f. Disciplinary period.
   g. Trends of thought.
   h. Athletic training in school and after.
   i. Manual dexterity.
   j. Occupations.
   k. Amusements.
   l, m. Tobacco and alcohol.
   n. Constipation.
   o. Drugs and medicines (reasons for use).
   p. Eating, sleep, sexual tendencies: normal or perverse.
   q. Attitude of family toward flying.
   r. History of dreams, complexes, etc.
   s. Financial, family or social difficulties.

Fit	*Unfit*
a. Temperament: Cheerful, stable, self-reliant, aggressive, modest, frank, fond of people, satisfied, punctilious, serious, good cooperation in work and in examination, good sportsmanship, moderate tension, enthusiastic, adaptable.	a. Temperament: Depressed unstable, submissive, pacific, vain, withholding, secretive, loquacious, likes to be alone, hypercritical of conditions, careless, frivolous, poor cooperation, irritable, poor sportsmanship (under adverse circumstances querulous and complaining), exceedingly high tension, lost enthusiasm.
b. Intelligence: Precise, penetrating, sharp, alert, resourceful.	b. Intelligence: Vague, superficial, dull, hesitant, without initiative, untrained.
c. Volition: Energetic, deliberate, quick or moderately impulsive, controlled, good tenacity of purpose.	c. Volition: Sluggish, slow, recklessly impulsive, restless, poor tenacity of purpose.

And, finally, the object of these examinations is the selection of a physically competent and well-balanced individual for the purpose of saving life, property and needless expense. Those who are not fitted by nature for the three dimensions of the world of the air must be satisfied with the two dimensional terrain into which the human race was born.

Diphtheria Mortality in Large Cities of the United States in 1930. This report concerns the ninety-three cities dealt with in the recent article on typhoid, and the rates are calculated on the basis of the population figures used in that article. The number of diphtheria deaths in each city has been reported by the respective health department. As in the article on typhoid, the diphtheria rates for 1925-29 have been recalculated on the basis of the population figures of the 1930 United States Census. The report shows a remarkable decline in the general urban death rate from diphtheria throughout the country. In 1930 the lowest diphtheria rate yet recorded was reached, a rate a little more than half that obtaining five years before. Whether the recent sweeping reductions in diphtheria mortality in various parts of the United States have been caused by natural fluctuations in the disease itself or in the susceptibility of the human host, or whether and in what part they have been brought about by such preventive measures as toxin-antitoxin and toxoid immunization, is a matter on which convincing evidence may be forthcoming in the course of the next decade.

THE EYE EXAMINATION AND SCHNEIDER INDEX OF AVIATION CANDIDATES *

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THE OPHTHALMIC EXAMINATION

About 74 per cent of the rejected candidates do not meet the standard of the various eye tests. Not many individuals are reporting for flight examination with constitutinal diseases or physical defects because this class is not particularly interested in aviation. The eye examination, therefore, becomes important. Out of fairness to the many who are rejected, it is necessary to adopt an inelastic set of standards by which the flight surgeon is to be guided. There is an abundance of statistical evidence showing the necessity of proper vision.

THE VISUAL ACUITY

The visual acuity is tested with the Snellen test charts at 20 feet. Sometimes it becomes necessary to have the candidate read the letters backward or use a chart that is not standard because they memorize the sequence of the letters. For pilots, 20/20 vision is required of both eyes. However, observers may be allowed 20/50.

DEPTH PERCEPTION

Depth perception is of a great importance for the judgment of distance. This is particularly true when landing. It is accomplished by correct muscle balance, producing accurate binocular vision with the correct fusion of the images as registered on the retina. This depends upon the interpupillary distance. The Howard-Dohman apparatus is used. This is a long black box with appropriate illumination, in the center of which are two upright pins. One is fixed at zero on a millimeter scale and the other is movable by means of cords. The candidate sits at 20 feet and attempts to line up these pins. The average of three or four readings is taken. Over 30 mm. disqualifies.

THE MADDOX ROD TEST

The importance of proper muscle balance has been demonstrated in pilots. There is a great deal of mental and eye fatigue when flying, especially for the early pilot, where the element of danger is more imminent. One may overcome small errors at first but after a time the element of fatigue becomes paramount. The person having a small amount of heterophoria has double vision when the fatigue is increased. Multiple Maddox rods and Risley rotary prisms are needed for the test with a light at 6 meters and again at 33 cm.

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* Read before a Meeting of King County Medical Society, Seattle, Wash., April 6, 1931.

Standards for 20 feet.

Over 4 △ of esophoria is disqualifying, if associated with other abnormalities.

Over 10 △ of esophoria is disqualifying, if not associated with other conditions.

Exophoria of over 2 △ is disqualifying, if associated with other abnormalities.

Exophoria of over 5 △ is disqualifying, if unassociated.

Hyperphoria of over ½ △ disqualifies for pilots. Observers are allowed 1.5 △.

Standards for 33 cm.

An exophoria of over 12 △ is disqualifying. An exophoria of 4 △ is normal at this distance.

The associated parallel movements are tested, then the accommodation with the Prince rule. In the Army tests, they measure and compute the angle of convergence; however, this is not done in the commercial examinations. Central color vision is tested with the Jennings, Ishihara and Williams charts and Holmgren wools, and the field of vision for form and color with the perimeter. Four to six per cent are rejected because of defective color vision. In borderline cases scotomata are mapped out with a tangent curtain. The ophthalmoscopic and general inspection, including tension, completes the eye examination.

PHYSIOLOGIC FITNESS

The physiologic strains, to which the aviator is subjected due to changes in altitude, are numerous. The men who tolerate oxygen changes or oxygen want readily are those who are able to call into action compensatory reactions. In normal persons the arterial blood is 95 per cent saturated with oxygen and the venous blood 65 to 75 per cent. With a diminished blood flow, as occurs in cardiac conditions, the saturation of either may fall 30 per cent.

The flight surgeon must be on the lookout for anoxemia. It may be diagnosed by the rebreathing test and the Schneider index. Anoxemia may be acute as in CO poisoning or chronic as in anemia, bronchitis, emphysema, asthma or heart disease.

1. When there is a deficient saturation of the blood in the lungs, it is known as anoxic anoxemia.

2. When there is deficient oxygen carrying power, it is known as anemic anoxemia.

3. When the blood flows too slowly to supply the tissues, it is known as the venous type of anoxemia.

4. When the hydrogen ion content of the blood is abnormally low, the O_2 does not dissociate readily and we have an acidosis anoxemia.

Schneider and Truesdell have analyzed 1,000 altitude classification tests on the rebreather and they find that 46 per cent of the aviators show a liability to fainting when under a low O_2 condition. They also showed that the O_2 supply in the body is steadily being reduced during rebreathing, which is exactly analgous to high airplane ascent.

The character of the breathing is important in an aviator. In shallow breathing, only a small amount of fresh air gets past the dead space. In the slower type of anoxemia, there is a shallow type of breathing. It has been demonstrated that aviators with staleness and exhaustion have a shallow type of breathing.

Staleness is a very definite entity in soldiers and in aviators. It is the result of prolonged mental and physical fatigue. It is an insidious affair but the aviator often overcomes it by a false sense of courage. Fatigue is difficult to measure.

The best tests are: (1) Tests of performance; as by the ergograph, the dynamometer tests, and laboratory mental tests; (2) tests of precision, as the reaction time machine.

It is believed that endurance tests give no exact measure of the status of the health. A pilot with fatigue or staleness is dangerous. This is one of the many reasons for having an examination every six months.

As a test for the general physical condition of the candidate, there is none of more value than the Schneider index. This is a test used by cardiologists. It has been adopted as a matter of routine for the Army and Navy. The test is reliable and simple. Twenty per cent are rejected because of an inadequate vascular system.

It is so sensitive that the flight surgeon can tell if the individual has been on a party the night before. It is influenced by excessive smoking, fatigue, insomnia, nervous instability, poor physical condition or the plethoric habitus. It is of value in giving an index of the degree of compensation in heart disease. It should not be used in advanced valvular disease or any condition where an acute dilatation may be produced from the exercise. It is of aid in making a diagnosis of effort syndrome or neurocirculatory asthenia, a condition of many

TABLE I

POINTS FOR GRADING CARDIO-VASCULAR CHANGES

A. RECLINING PULSE RATE		B. PULSE RATE INCREASE ON STANDING				
		0-10 beats	11-18 beats	19-26 beats	27-34 beats	35-42 beats
	Points	Points	Points	Points	Points	Points
50- 60	3	3	3	2	1	0
61- 70	3	3	2	1	0	—1
71- 80	2	3	2	0	—1	—2
81- 90	1	2	1	—1	—2	—3
91-100	0	1	0	—2	—3	—3
101-110	—1	0	—1	—3	—3	—3

C. STANDING PULSE RATE		D. PULSE RATE INCREASE IMMEDIATELY AFTER EXERCISE				
		0-10 beats	11-20 beats	21-30 beats	31-40 beats	41-50 beats
	Points	Points	Points	Points	Points	Points
60- 70	3	3	3	2	1	0
71- 80	3	3	2	1	0	0
81- 90	2	3	2	1	0	—1
91-100	1	2	1	0	—1	—2
101-110	1	1	0	—1	—2	—3
111-120	0	1	—1	—2	—3	—3
121-130	0	0	—2	—3	—3	—3
131-140	—1	0	—3	—3	—3	—3

E. RETURN OF PULSE RATE TO STANDING NORMAL AFTER EXERCISE

Seconds	Points
0- 30	3
31- 60	2
61- 90	1
91-120	0
After 120: 2-10 beats above normal	—1
After 120: 11-30 beats above normal	—2

F. SYSTOLIC PRESSURE STANDING COMPARED WITH RECLINING

Change in mm.	Points
Rise of 8 or more	3
Rise of 2-7	2
No rise	1
Fall of 2-5	0
Fall of 6 or more	—1

subjective but poorly defined objective findings. It is a good procedure to grade the patient on before giving an anesthetic. It should be made in all having a reclining pulse rate of over 90.

Procedure: The subject reclines for five minutes, then the heart rate is counted for twenty seconds. When two twenty second counts are the same multiply by three and record. The systolic pressure is taken, after which the patient rises with the cuff on and the pulse is taken after he has been standing for two minutes. The standing systolic pressure is then taken. The subject then steps by one foot upon a chair 18 inches high, five times in fifteen seconds as timed by a stop watch. Immediately, when the fifteen second mark is reached, the count of the pulse is taken for the next fifteen seconds. Multiply this by four and record. The rate for every fifteen seconds is taken until the return to normal occurs. If it does not return to normal in two minutes, the rate then is recorded. Reference is made to the chart (table 1) and a grade computed. Plus 8 is taken as the lower limit in aviation examinations.

INNOCENT GLYCOSURIA. Harry C. Powelson, Rochester, Minn., and Russell M. Wilder, Chicago (*Journal A. M. A.*, May 9, 1931), present the results of a study of ninety-one cases in which benign glycosuria was diagnosed on the basis of the response to the simple oral dextrose tolerance test. The patient reported for the test after a fast of from twelve to sixteen hours, having received adequate carbohydrate previously. One hundred grams of dextrose was given by mouth, with 500 cc. of water. Samples of urine and venous blood were taken before, and one-half hour, two hours and three hours after the dextrose was given. The determinations of blood sugar were made with the technic of Folin and Wu. The urine was tested with qualitative Benedict's solution. It was found that benign glycosuria presents no definite symptoms, and many cases probably escape detection. Normoglycemic glycosuria is by no means uncommon. Patients with benign glycosuria lose weight and strength when placed on treatment for diabetes. They gain in weight and strength when dietary restrictions are removed. They may be made very uncomfortable by treatment with insulin. On the other hand, true diabetes mellitus should be recognized early and treated appropriately in order to suspend its normal tendency to progression. The simple dextrose tolerance test described is a reliable procedure for differentiating normoglycemic glycosuria from early or mild diabetes mellitus. Of eighty-two cases diagnosed normoglycemic glycosuria by this test, diabetes mellitus did not develop in any in the intervals of one to twelve years that elapsed after the tests were made. The familial character of normoglycemic glycosuria is illustrated by a family in which the mother and four of six children were shown to have the disorder.

FOOD ALLERGIES IN CHILDREN*

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The newer knowledge of nutritional allergy makes us appreciate the literal truth of the trite old saying that, "what is one man's meat is another man's poison." It is believed that the basis of allergic nutritional disease is faulty absorption from the digestive tract and imperfect function of the liver which allow partly digested proteins to enter the blood stream. These unsplit proteins act as foreign substances in the blood, causing sensitization and allergic symptoms whenever the foods containing them are fed. Diseases which may be caused in this manner are colic, nausea, vomiting, diarrhea, urticaria, angeoneurotic edema, eczema, coryza, bronchitis and asthma. Heredity is an important factor in food allergy, positive family histories being obtained in over 50 per cent of our cases.

It can readily be seen that the delicacy and immaturity of the infant's digestive tract would permit the absorption of undigested material much more easily than in an older person. This is why food allergies are more frequent in children than in adults, and in young children than in older ones. Sixty-two per cent of our cases of eczema have been in children under two years of age. If the tone of the digestive tract has been lowered by intercurrent infection or there is an acute inflammatory process there, the increased permeability of the injured mucosa permits of a more ready absorption of incompletely digested protein. It is not surprising that at such times acute exacerbations of eczema or the appearance of hives are common.

The first symptoms of allergy to appear and those the least often recognized are of the digestive tract. A history of colic is obtained in many cases of later allergic disease. It is a well known fact that infants have less colic and vomiting when fed breast milk or acid, dry, evaporated or boiled milks than when fed raw milks. These foods have a common characteristic, a curd much smaller and more easily digested than the raw cow's milk curd. May it not be that the more complete digestion of the small curd lessens the possibility of the absorption of unsplit protein? Later in infancy, when solid foods are added one by one to the infant's diet, mothers are able to note accurately their effect on the child. It is not uncommon to hear that the baby vomits egg-yolk whenever it is fed or that he has diarrhea when he eats spinach. It often happens that a food, for which a child has a persistent aversion, is one to which a skin test will show that he has an allergic reaction.

Eczema is the next allergic phenomenon to appear. It may develop while the digestive symptoms are still present or as a sequel to them. Although both eczema and indigestion are more frequent among artificially fed infants than in the breast fed, the fact that they do often occur in the breast fed has proven a stumbling block in the way of acceptance of the allergic theory of infantile eczema. Shannon was the first to produce evidence that unsplit protein absorbed from the mother's digestive tract may be carried in the milk in sufficient quantities to produce symptoms in the child, when she herself was free from them. He studied the skin reactions of mothers and infants suffering from colic, vomiting, diarrhea, coryza, bronchitis and eczema. He found that infants often reacted to proteins, to which the mothers failed to react and that, if these foods were eliminated from the mother's diet, the infant's symptoms improved or disappeared.

The respiratory symptoms of food allergy are usually the last to develop. The asthmas of childhood have practically always an allergic cause. The exciting factor may enter the body through the digestive tract as food or through the respiratory tract in pollens, animal emanations and other fine particles floating in the air. The younger the child, the more apt is the cause to be a food idiosyncrasy. If there is also a history of eczema or other allergic phenomenon, there is little doubt that food is at least one exciting factor. Earlier respiratory symptoms are snuffles, frequent head colds and bronchitis. Of eleven of our recent cases of asthma thirty-five per cent had had severe digestive symptoms in early infancy, forty-five per cent had had eczema and fifty-five per cent bronchitis or frequent colds.

The food proteins causing these reactions are determined by the history and by skin tests. Group testing and nonspecific testing, formerly popular methods, have been the cause of failure and loss of confidence in scratch tests. Testing must be specific and complete. Most allergic patients have a polyspecificity, i. e., are sensitive to several proteins. Some two hundred food tests are, therefore, advisable. Twenty tests are usually done at one time and in all but the very small patients from ten to twelve sittings are required. If a suspected protein gives a negative scratch test, the test is repeated. If negative the second time, an intradermal test is made. In certain cases passive-transfer tests are desirable.

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* Read before Fifty-sixth Annual Meeting of the Oregon State Medical Society, Portland, Ore., September 17-19, 1930.

A few illustrative cases will emphasize some of the more important points.

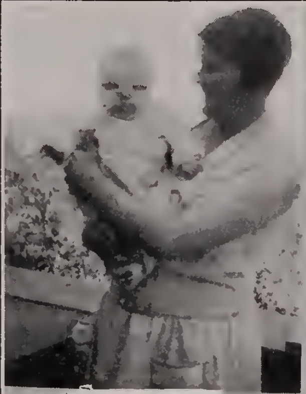
Fig. 1.

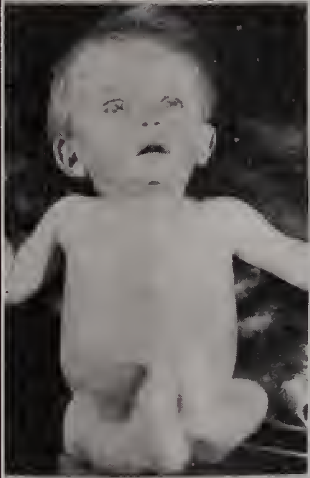
Fig. 3.

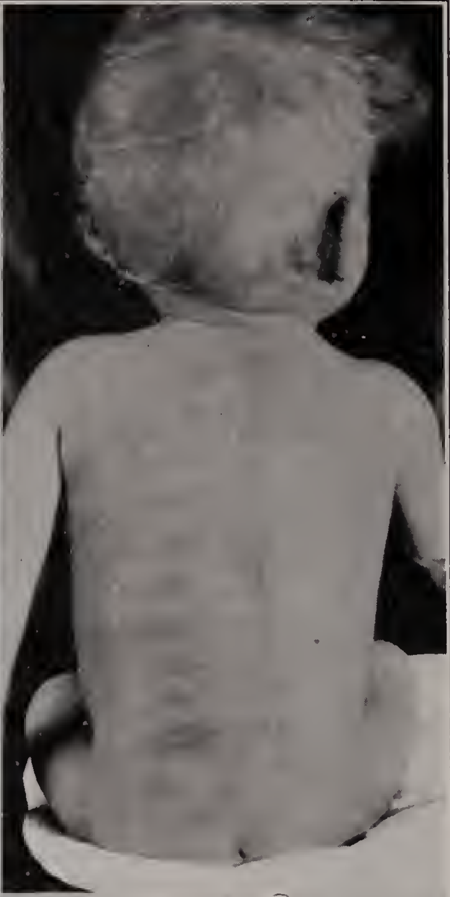
Fig. 4.

Fig. 1. P. W., aged 6 months. Extensive weeping eczema of face, trunk and extremities.
Fig. 3. P .W., aged 13 months. Condition of skin after two months elimination of the foods giving the reactions indicated in fig. 2. Marked improvement.
Fig. 4. P. W., aged 17 months. showing reactions to food proteins. Skin lesions entirely healed.

Case 1. P. W. No. 3837, had the following allergic family history. His maternal grandmother has hay-fever; his mother had hay-fever, chronic head colds, asthma; his sister vomits eggs whenever they are given her. He was a premature baby, weighing two pounds and fourteen ounces at birth. Because of his feebleness he was unable to stimulate the breasts sufficiently and the supply of breast milk failed. Colic and eczema, which appeared while the baby was on the breast, grew worse on evaporated milk and dried cow's milk. At about five months of age, when fresh milk and again at seven months of age, when cereals were started, there were severe exacerbations of eczema.

The skin was denuded and there was continual oozing from the cheeks, neck, upper arms, the front of the chest and the lower legs (fig. 1). The baby weighed thirteen pounds, was unable to sit alone, had a hemoglobin of forty per cent and an extensive eczema, especially on the body, when we first saw it at ten months of age. The scratch tests showed that there was some sensitization to several proteins but the outstanding information obtained was the extreme sensitivity to cereals and eggs (fig. 2). Because farina and corn meal were the only cereals giving negative or slight reaction on the first test, the mother was permitted to feed them to the child. There was no difficulty with the corn meal but the baby disliked farina and vomited it. A retest showed a violent reaction (++++). A diet, arranged to eliminate the foods with severe reactions and to limit those with moderate ones, resulted in an almost immediate subjective improvement and a gradual disappearance of the rash (fig. 3), until at seventeen months the skin lesions were entirely healed (fig. 4).

Forbidden foods		Restricted foods			
Barley	+++	Apricot	+	Plum	+
Egg	++	Chicken	±	Prune	+
Egg-yolk	+++	Egg-white	+	Raisin	+
Lamb	++	Gelatine	+	Rice	+
Lima bean	++	Halibut	+	Rhubarb	+
Navy bean	++	Lemon	+	Tapioca	+
Oat	++	Lettuce	±	Turnip	±
Rye	++++	Milk (cow)	+	Veal	+
Wheat	+++	Mutton	+	Wax bean	+
Farina	++++	Orange	+	Yeast	-
		Pea	+	Milk, albumin	+

Fig. 2. P. W. Positive food tests. Cereals and egg are the chief offenders.

It is interesting to note that the baby had suffered from an almost constant coryza during these months that he was under our observation. The mother, after an unusually severe attack of asthma, wished to have the skin tests for herself and it was found that she was very sensitive to cotton seed. Questioning brought out the fact that she was using an old and cheap mattress. When this was discarded and replaced by one containing no cotton, the asthma disappeared. After this experience the mother wondered, if there might not be a relation between the child's coryza and his mattress, so on her own initiative she replaced it. The child has had no coryza in the four months since the mattress was changed.

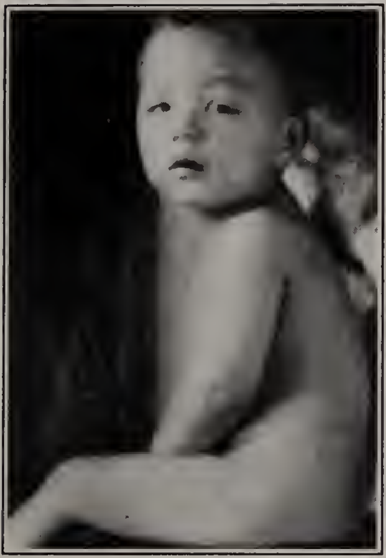

Fig. 5. Baby H. Angioneurotic edema following ingestion of egg. Note swollen eyelids and lips.

Case 2. Baby H. During the first weeks of his life he had vomited a great deal. When he was seen at six months of age he had had eczema of both cheeks for several months. The mother was badly frightened when the baby was nine months old by the sudden appearance of a rash which extended from his scalp to the soles of his feet. The mother stated that the skin was red and swollen and itched. Questioning brought out the fact that the baby had been fed pancakes for breakfast which contained eggs, white flour and milk.

Five months later the mother hurried with the baby to the office because of a similar but more severe attack (fig. 5). The child was nauseated, vomited, had fever, eyes were swollen shut and the skin all over the body was red and swollen, following the ingestion of a small amount of egg. Incomplete testing showed a very violent reaction to both egg-white and egg-yolk. There have been no recurrences in the past year since all foods containing egg have been omitted from the diet.

Case 3. L. G., aged sixteen, had been troubled for ten months with a skin lesion which had been diagnosed both as erythema nodosum and hives, and for which she had consulted several physicians without results. She had had attacks of abdominal pain all her life and frequent colds. The rash appeared as welts the size of the palm of the hand which were red, hot and itching. These disappeared in a few hours, leaving a red blotch. There was also swelling of the face and pain and swelling of the joints.

The most important information gained from her tests was that whole wheat and spinach proteins gave severe reactions. The patient stated that she disliked both of these foods but her mother insisted on her eating them frequently because she thought they were good for her. Elimination of these and a restriction of foods giving mild reactions has prevented a relapse in the four years that have passed since the tests were made.

Case 4. W. D. was six weeks of age when he was referred by Dr. Dora Underwood with the complaints of failure to gain, colic and eczema. Necessary steps for increasing the supply of breast milk were taken. Since at that time we had no very satisfactory material for skin testing, none was done but the mother was empirically advised to limit her milk intake and omit eggs and oatmeal from her diet. During the month we observed the child it gained nineteen ounces and the colic and eczema disappeared completely.

Forbidden foods		Restricted foods				Avoid	
Cow's milk	++	Spinach	+	String bean	+	Cat hair	+++
Egg	++++	Chicken	±	Apple	±	Rabbit hair	++
Onion	++	Beet	±	Orange	±	Chicken feathers	±
Pea	++	Asparagus	+	Corn	+	Goose feathers	±
Wheat	+±	Potato	+	Rye	+	Sheep wool	±
English waln't	+++	Cabbage	±	Oat	+	Dog hair	±
Peanut	++	Celery	+	Farina	+		
		Lettuce	+	Cocoa	+		

Fig. 6. W. D. Positive food tests. Elimination of the reacting foods cured the asthma.

Five years later he again came under our observation. At four months of age the baby had been weaned. Soon after this a severe eczema appeared which lasted until the child was eighteen months old. At about this time he began to have typical attacks of asthma. During the last three years these attacks had made it necessary for the mother to be up to care for the boy at least once each night (fig. 6). Skin tests showed that the boy was very sensitive to egg, and walnut and moderately so to milk and several other foods. These foods were eliminated and three months later the mother reported remarkable improvement, stating that only one mild attack had occurred since the change in diet.

CONCLUSIONS

1. Food allergies are very common in children.
2. Persistent dislike of a certain food should not be ignored for it may have an allergic basis.
3. Most susceptible children suffer from more than one form of allergic disease. These usually appear in sequence.
4. If, as soon as the first symptoms appear, a thorough study of the cause by means of skin tests is made, a long train of unfortunate developments will be prevented.

FRACTURES OF THE PELVIS *

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AND
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This paper is based on a study of forty personal cases and of the records of three hundred and twelve cases in the files of the Washington State Department of Labor and Industries. They are of different types and caused by all sorts of accidents, the industrial cases occurring chiefly in logging camps and mines. With the nonindustrial case the automobile is the most frequent offender.

In an article published in 1928 Sever gives a very complete resumé of the literature of the past twen-

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* Read before the Pan-Pacific Surgical Conference, Honolulu, H. T., Aug. 20, 1929.

ty years. For details we refer to this article. With a few exceptions all the authors quoted agree in the following three conclusions: (1) Pelvic fractures are very rare. (2) The mortality rate is very high. (3) The end-results are "surprisingly good." These conclusions are so at variance with our observations in our own cases and with the records of the State Department of Industrial Insurance that we are prompted to put our results on record. The records of the state for the five years, ending December 31, 1928, gives 312 cases occurring in 19,170 fractures, a percentage of 1.9. Our impression is that in our private cases the percentage would be somewhat higher than that.

Pelvic fractures are practically always the result of direct violence, usually lateral compression causing a bursting at one or more points in the circumference of the pelvic ring, the degree and anatomic localization of the injury varying without any apparent regard to the actual causative agent. Only twice have we seen fractures the result of indirect violence. In both cases there was extreme abduction of the leg with resulting fissure fracture of the ascending ramus of the pubis on the same side.

Authors have described as many as ten different types of fractured pelvis, but for practical clinical purposes, particularly with regard to treatment and prognosis, they can all be included in three main classes: (1) Fractures of the wing of the ilium, (2) fractures of the acetabulum, (3) fractures of the pelvic ring.

Fractures of the iliac wing are always the result of lateral compression, the fracturing force striking the body at a point too high to involve the pelvic ring. These fractures are usually readily diagnosed by the abnormal mobility of the crest, but sometimes attention is drawn to the injury only by persistent localized pain, when a roentgenogram discloses a fissure fracture.

Fractures involving the acetabulum are the result of a direct blow on the great trochanter. Most frequently they follow heavy falls in laboring men but of recent years they have occurred in automobile accidents with increasing frequency. They bring up an interesting question in mechanics. Just when will a fracturing force injure the acetabulum and when the neck of the femur? It would seem that, when the force is delivered exactly parallel with the long axis of the neck of the femur, the acetabulum will yield, because the gothic arch-like structure of the bone laminae of the neck transmits the force directly through the head to the floor of the acetabulum. A force impinging at any angle to this line results in a fracture of the neck of the femur.

The extreme degree of acetabular fracture is represented by the so-called "central dislocation of the head of the femur," when the head is driven clear through the floor of the acetabulum and rests within the cavity of the pelvis. In our series we had one case of this type.

Fractures occurring anywhere in the circumference of the pelvic ring are the result of lateral compression. Whenever a ring is forcibly compressed from opposite sides, the breaking points will be somewhere near the intermediate poles. This principle holds true, whether there be simply one or more fractures of the rami, or it results in the complete double fracture of Malgaigne. In the first case the lateral compression produces a fracture or fractures about the anterior pole and a distortion or rupture of a sacroiliac articulation at the opposite pole. This the roentgenogram frequently does not disclose and it is, therefore, overlooked and not discovered until later, when the patient begins to get about, a very important factor in the production of the disability following this type of injury.

Of greatest importance in determining immediate fatality is the presence of complicating injuries to the viscera within the pelvic cavity. In our series of forty cases there were seven, 17.5 per cent. In the state records of 312 cases there were twenty-five, 12.5 per cent. By far the most frequent complication is injury to the urinary tract. In our cases it occurred six times and in the state's series twenty-three times.

Very rarely are injuries to the rectum encountered. We have seen one case in a compound fracture, the result of a gunshot wound. In the state's series there are the records of two.

Cotton describes a complication due to massive retroperitoneal hemorrhage, giving rise to symptoms strongly suggestive of an intraperitoneal lesion. We have never encountered this condition. Once we have seen an injury of the anterior crural nerve, giving rise to immediate severe pain about the knee and later manifesting a marked weakness of the anterior thigh muscles.

TREATMENT

When a fractured pelvis is first seen, attention should at once be directed toward determining the possible presence of a complicating injury of the soft parts, more particularly of the urinary tract because of their greater frequency. The literature contains many descriptions of methods of diagnosing urethral and bladder injuries with the catheter and measured quantities of fluids. We have found these methods not only unsatisfactory but unnecessary.

Whenever a patient with a fractured pelvis presents blood dripping from the external meatus without any urge to frequent urination, or we get the history that he has attempted to void without success, we may safely infer an injury to the deep urethra. If with urethral bleeding he manifests a constant desire to urinate and only succeeds in passing a few drops of bloody urine, there is quite certainly an injury to the bladder wall. With any of these symptoms present the patient should be sent to the surgery and prepared for immediate operation.

Only once have we been led astray by these symptoms. A miner with a double Malgaigne fracture was brought into the hospital. He was voiding about every half hour without difficulty though in small quantities. The urine was deeply colored with blood. The urethra and bladder were found to be intact; a cystoscopic examination was immediately made and the blood was seen coming from the right ureter. There was a laceration of the kidney.

Only when the patient is prepared and on the table should the catheter be used. If a soft rubber catheter cannot be introduced into the bladder, a ruptured urethra is quite certain and a perineal section should be done at once. If the bladder can be entered but only a few drops of bloody urine come out, the probability of bladder injury is great. Instead of injecting measured quantities of fluid into the bladder, we have found the injection of air much easier and much more satisfactory. With a glass syringe provided with a rubber bulb, inject air into the bladder, compress the catheter with the fingers, disconnect the syringe, hold the end of the catheter under water, release the fingers. If the air rushes back with great force. we may be sure the bladder is intact. If only a few bubbles come back without force, we have an extraperitoneal rupture of the bladder, and nearly always we can feel the crackle of air above the pubis. If no bubbles come back at all, we have an intraperitoneal rupture of the bladder.

Bladder injury demands immediate suprapubic operation with suprapubic drainage. If the air test shows probability of intraperitoneal rupture, the peritoneal cavity should be opened at once. Otherwise the bladder should be opened extraperitoneally and the space of Retzius drained. By carrying out this plan of immediate action all the dangers of infiltration of urine and consequent suppuration and sloughing are avoided, and immediate mortality reduced.

One of our cases, a structural iron worker, fell astride of a steel bar, fracturing his ischium and dividing his membranous urethra. He was operated on two hours after his injury without his having attempted to void and without attempting to pass a catheter. The divided ends of the urethra were easily found, no retraction having taken place. They were easily sutured together over a catheter, the wound healed by primary union and was entirely closed in seven days.

If early operation were always done, there would be no necessity to resort to retrograde catheterization to find the retracted proximal stump of the urethra.

It must be remembered that a divided deep urethra always constitutes a potential source of disability because of the tendency of the scar to contract. One of our patients, a farmer, fell from a tree, lighting astride a rail fence, in 1909. He fractured his pubis and severed his deep urethra. Three days later he was brought to the hospital with extravasation of urine and much infection. By the aid of suprapubic and perineal drainage he finally recovered after a stormy convalescence. Since then he has returned once a year to have his urethra dilated and even now, after twenty years, the scar tissue shows a strong tendency to contract.

Injuries to the rectum, though very rare, should not be forgotten. The chief danger lies in infection and sloughing. When of any extent, much time can be saved and suffering avoided by immediately doing a temporary colostomy. It is astonishing how rapidly a large rent in the rectum will heal practically without any suturing, if the fecal stream is kept away from the wound.

Treatment of the fractured bones demands more active and discriminating attention than is generally accorded them. An examination of the literature leads to the conclusion that a perfunctory rest in bed, with the possible addition of a binder about the hips, has constituted the bulk of the treatment. This, in our experience, is entirely inadequate and is undoubtedly responsible for a share of the permanent disability which the records of our state insurance department disclose.

Even fractures of the iliac wing, which are the least disabling, demand active treatment. These fractures are frequently very painful in the first stages. Every movement of the body causes acute pain at the seat of fracture. A tight binder about the pelvis is more likely to increase the pain than help it. A well fitting body cast, extending from the axilla to the trochanters, stops the pain almost instantly. It can be removed in three weeks and the patient allowed to get up. There is no resulting disability.

Fractures involving the acetabulum result in a high percentage of disability. A great deal of this disability can be avoided by intelligent treatment at the outset. These cases always result in ankylosis. If the leg is held in a favorable degree of abduction until ankylosis has taken place, a stiff hip in a favorable position results which is not nearly so crippling a condition as a stiff hip with the leg straight.

It is our custom to put these cases in a Whitman cast the same as for a fracture of the neck of the femur, except that the degree of abduction is less, usually about twenty degrees. The patient remains in the cast twelve weeks. He then gets about with crutches and usually with a lift on the shoe. In a laboring man there is always some resultant disability. We have had occasion to examine a number of laborers with ankylosis in the leg straight position. The resulting disability was almost total as far as ever being able to resume their former occupations. The abduction treatment we have found always lessens the resultant disability very materially.

One of our cases, a woman, was injured in an automobile accident in 1920. The head of the femur was driven through the acetabulum into the pelvic cavity. Under full anesthesia reduction was accomplished by abduction and traction and pressing on the head through the vagina. Traction in a position of abduction was kept up for two weeks and then she was put in a Whitman cast. After twelve weeks she was gotten up on crutches with a lift on the shoe.

In a few months she could get about with surprisingly little limping. A roentgenogram taken a year later showed what looked like complete bony ankylosis. She continued to lead a very active life, indulging in dancing, hiking and tennis playing. Recently she was reexamined, nine years after the accident. She had regained almost a complete range of motion in the hip joint, only a limitation of abduction remaining. This we are certain was possible only because the abducted position allowed her to get about with a minimum of limping.

All fractures about the pelvic ring hold potential possibilities of subsequent disability. This is even more true in the apparently minor fractures of the rami than in the complete double fracture of Malgaigne with gross displacement. A nonunion of a fractured pelvic bone is practically unknown, but failure of the symphysis pubis to unite is very common and a disrupted sacroiliac articulation practically never becomes normal again. This, we believe, is the reason why severe fractures with gross displacement, when properly treated, often give better results than fractures which at the outset appear less serious.

It is a common experience to encounter cases showing one or more fractures about the rami or near the symphysis and no apparent injury to the posterior portion of the pelvic ring. While the patient is in bed, he apparently makes perfectly normal progress. But shortly after he gets up he begins to complain of pain in his back which constantly increases and is referred down the back of one leg; in short, a sacroiliac pain. For a man working in a logging camp or a mine this constitutes a very serious disability for it prevents him from doing anything but very light work and very materially reduces his earning powers. It is our custom to treat these cases with a double spica cast for twelve weeks and to keep them on crutches for several weeks after getting up. By this method we believe resulting disability is materially reduced.

Every case showing upward displacement of one-half of the pelvis, even of slight degree, should be treated with traction. We prefer skeletal traction applied with ice tongs just above the condyles of the femur. We begin with a maximum weight and gradually decrease it after reduction is accomplished. As soon as the deformity shows no tendency to recur the patient is put in a double spica cast.

Frequently upward displacement is accompanied with a lateral spreading, caused by separation at the symphysis. These cases require suspension. We use a wide canvas band with a rod fastened in each end. To these rods ropes connected with overhead weights are attached. The ropes are crossed over the center of the body, so that the right hand ropes cross to weights hanging over the left side of the bed and vice versa. By this means lateral compression is produced as well as suspension (fig. 1).

Failure to get firm union at the symphysis is of frequent occurrence, even when early accurate reduction is accomplished. Twice we have secured firm union and recovery without disability by wiring the two pubic bones together. This is of value only when done early. As a means of treating an old case with resulting disability it has not been so successful. We have employed a method of applying powerful vertical traction and lateral compression with the patient on the Hawley table, thus reducing the displacement and holding the parts in

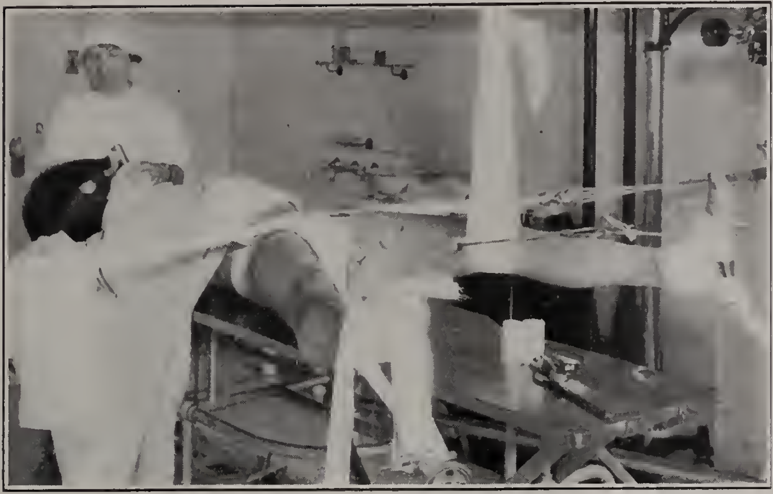

Fig. 1. Aparatus for traction and suspension with lateral compression.

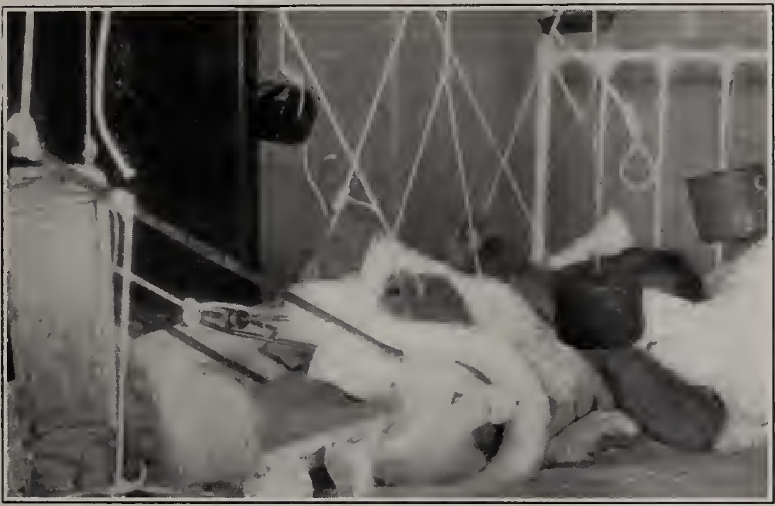

Fig. 2. Apparatus for immediate forcible reduction in case of extensive fracture and displacement.

position while the wiring is done. This converts an otherwise difficult procedure into a comparatively easy and simple one. Two of our cases by this means have been enabled to return to their old jobs in the mines without disability (fig. 2).

Old cases with high degrees of disability due to displacement and nonunion of the symphysis have not been greatly benefited by this method; nor has the method of fixing a bone graft across the symphysis given much better results. This is not surprising, since the greater part of the disability is due to the disruption of the sacroiliac articulation. Theoretically a fixation operation at this joint, such as the Smith-Petersen operation, should be of value, but our experience with this method has not been sufficient to justify any conclusion. The truth is that the time successfully to correct disability is when the fracture is fresh; all subsequent reconstructive operations on the pelvis are likely to be disappointing.

In our series of forty cases we had one fatality, 2.5 per cent. In the state's series of three hundred and twelve cases there were forty-seven deaths, 15 per cent. While this is considerably less than the mortality rate generally given in the literature, it would see mto be too high. The greater part of the primary mortality is due to the complicating injuries to the soft parts. If they are given prompt and active treatment such as has been outlined here, the mortality ought to be brought down well under 10 per cent.

There were none of our cases that could be fairly rated as being left with a total disability. In eight the result was classed as poor or fair, giving 20 per cent who recovered with some degree of permanent partial disability.

In the state's series twelve were rated as having total permanent disability and one hundred and seventeen as having permanent partial disability. That is, 41.3 per cent were left with some degree of disability, ranging all the way from 5 per cent up to total. We recognize that there will probably always be a greater resulting disability in industrial cases than in other practice. Aside from the ever present question of compensation, the fact remains that an amount of crippling, that might not be particularly disabling to the business or the professional man or to the housewife, would constitute a distinct disability to the laborer working in a logging camp or the mine.

CONCLUSIONS

1. Fractures of the pelvis occur more frequently than the literature would have us believe and are likely to occur with increasing frequency in future.

2. The mortality rate is not as high as generally given in the literature, but is still considerably higher than it ought to be.

3. The final results are not "surprisingly good." On the contrary, they are disappointingly bad. With proper treatment these results can be very materially improved.

INTRAVENOUS UROGRAPHY
BY USE OF UROSELECTAN VERSUS RETROGRADE PYELOGRAPHY[*]

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Any one who has had considerable experience in urology realizes, no doubt, that accuracy in diagnosis in the urinary tract is largely due to experienced interpretation of cystoscopic and radiographic findings. Although both the cystoscope and the radiograph are of individual value, we have learned to recognize that neither method is complete without the data obtained from the other. Therefore, the union of the two methods in simultaneous examinations, generally known as pyelography, has for a number of years given us a valuable field for diagnostic data.[1]

The data which we usually depend upon to aid us in our interpretation of urological conditions are those obtained from the subjective symptoms, the physical examination, the cystoscope and the radiographic study. Experience has taught us that subjective symptoms referred to in the urinary tract are very often unreliable. Also it has long ago been recognized that reflex gastric symptoms may predominate in the clinical picture as the result of disease in the gallbladder, duodenum or the appendix, etc. The underlying lesion in the kidney may have little or no localizing symptoms, while the secondary vesical condition may give rise to all the subjective symptoms.[2]

Evidence obtained through the cystoscope and the ureteral catheter will usually be found to give most valuable information. The radiographic study, after the injection of some opaque solution through a catheter into the kidney pelvis and ureter, generally known as *retrograde pyelography*, has in late years proven an indispensable adjunct but naturally the most perfect and careful radiographic technic must be used, and the more experienced the operator, the more accurate will be the interpretation of the films. But, even with the best radiographic technic and extensive experience, very frequently findings in the radiograph will not tally with the clinical evidence, or will require further data before their identity can be established.

There can be no doubt that frequently renal and vesical pathology have been and are overlooked, due to the fact that cystoscopy and catheterization of the renal pelvis are painstaking procedures which require considerable skill, experience and practice. Consequently they are not performed often enough except by urologists. Therefore, the intravenous injection of uroselectan, I am sure, will in the future solve many urologic problems without the aid of ureteral catheterization.

Theoretically it would hardly seem possible that any substance injected intravenously could be secreted by the kidney in such concentrated form as to cast a shadow of the renal calices, pelvis and ureter on the radiograph. However, a combination of iodine in high concentration with a pyridine ring, called "selectan neutral," had been discovered by Binz and Raeth of Berlin, and was being used intravenously as an antiseptic. But Swick, a fellow of the Libman Foundation, recognized the value of the selectan group in outlining the urinary tract following intravenous injection, only this medium proved toxic in some cases and the shadow of the renal pelvis was frequently uncertain.[3]

Binz and Raeth then assisted Swick in evolving a more potent chemical compound by replacing the methyl group of "selectan neutral" with sodium glycin and increasing the water solubility by reducing the iodine content from 54 to 42 per cent. They called this new substance "uroselectan."[4] According to accepted chemical nomenclature it is the sodium salt of 2-oxo-5-iodo-pyridine-acetic acid. It is an extremely stable compound, highly soluble and excreted by the kidneys with no toxicity. In the normal individual the excretion is rather rapid.

The author does not wish here to discuss the technical details in their entity relative to the application of uroselectan, but merely to state that we inject 100 cc. of a 40 per cent uroselectan solution and take the first film immediately after the injection, followed by a series of films over a period of one and a half hours, watching each film for being technically and diagnostically perfect.

The use of uroselectan in intravenous urography is of following value:

1. It produces visualization of the urinary tract with special reference to its systemic pathology and physiology.

2. It furnishes, through radiographic appearance and qualitative and quantitative chemical analysis, knowledge of the renal function.

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[*] Read before the meeting of Walla Walla Valley Medical Society, Walla Walla, Wash., April 9, 1931.

[1] Braasch, W. F.: The Radiographic Shadow and the Cystoscope. J. S., G. and O., 12:374-378, April, 1911.

[2] Ibid: Pyelography. Saunders Co., 1915.

[3] Swick, M.: Darstellung der Niere und Harnwege im Roentgenbild durch intravenose Einbringung eines neuen Kontrastsstoffes, des Uroselectans. Klin. Wchnschr., 8:2087-2089, Nov. 5, 1929.

[4] Ibid: Intravenous Urography by Means of Uroselectan. Am. J. Surg., 8:405-414, Feb., 1930.

Roseno, A.: Die intravenose Pyelographie. Klin. Wchnschr., 8:1165-1170, June 18, 1929.

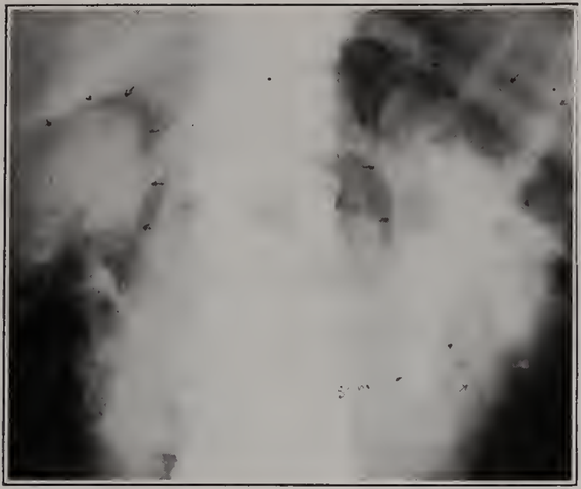

Fig. 1. Immediately after the injection of uroselectan, one large stone blocking the left ureter just at the renal pelvis. Left hydronephrosis. Hypertonia of right kidney.

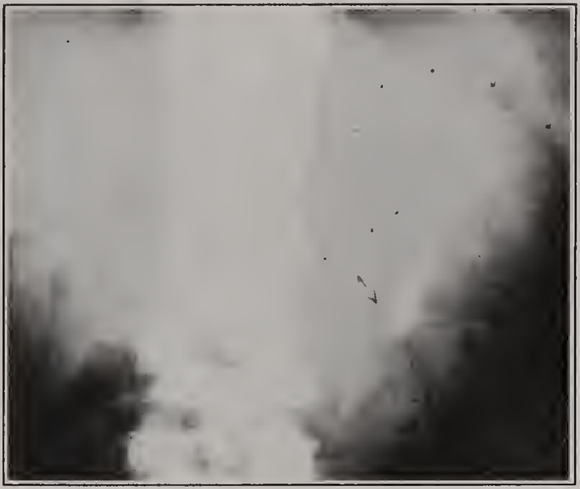

Fig. 2. Advanced bilateral renal tuberculosis. Radiograph 30 minutes after injection of uroselectan. Note the "kink" of the ureter, which in this instance is due to the film taken when patent is holding a deep breath, while another film taken on complete expiration shows absence of the kink. Such technicality may lead to serious error in interpretation.

3. It furnishes an insight into the dynamics of the urinary tract by permitting the examiner to observe the expulsion of the medium through the tract.

In connection with the first statement, in reference to the pathology and physiology of the urinary tract, it is of importance to know what type of film one may expect from this method. Of course, a diagnostic film can be expected only in cases in which renal function is present, and the density of this film is dependent on the amount of function that exists. Severe bilateral infections of the kidneys, especially when the parenchyma is damaged, give no or only very faint shadows.

The contrast of the film is entirely dependent upon the concentrated uroselectan solution eliminated, and even in the very best cases we must not always expect very dense shadows. On the contrary, where damage exists, the intensity of the shadow is markedly diminished. In blocked conditions of a ureter one frequently obtains more clearly defined shadows than would be expected from the concentration of uroselectan eliminated by the kidney (fig. 1).

We must take into consideration to what extent the excretory passages are filled with the opaque solution, as well as the state of the passages after they have emptied naturally. By this I mean only those parts can be filled which are in a relaxed state when the solution reaches them, i.e., the state of diastole, while the contracted parts of the calices and ureter, in other words those parts which are in state of systole, cannot be visualized properly on the radiograph. One must remember that we are dealing with a dynamic condition of the urinary tract which, as in the case of peristalsis in the digestive tract, is constantly undergoing change in form.

It is necessary that the interpreter has a thorough knowledge of the radiographic technic and its various problems so as to avoid common technical errors which may result in mistaken interpretation. For instance, a so-called "ureteral kink," as illustrated in fig. 2 presents a single example of a pitfall believed to be a common one for the untrained interpreter. Therefore, there are many such instances which, due to the untrained and inexperienced examiner with this method, might be interpreted as organic defects or pathologic lesions.

As a result of our limited experiences, the author has observed by this time that testing for function by this method cannot be an exact procedure, but it apparently will suffice for the gross clinical diagnosis of pathologic or surgical lesions. Localization of the infection is possible in unilateral conditions, and often in bilateral conditions it is possible to establish which side is most affected, but simple disturbances of the renal function only are not perceptible by this method.

Relative to another statement, that intravenous injection of uroselectan furnishes a knowledge of the renal function, the author finds that von Lichtenberg of Berlin[5] has found that excretion of the uroselectan by the kidney can be followed, aside from the roentgen-ray control, through the control of the excretion of the substance itself, through the control of the iodine excretion, through the control of the increased specific gravity, which can all be regarded as excretion tests in the general sense of the word, and through the fixation of the uroselectan in the blood, which can be viewed as a retention test. All of these together present a type of function test of the entire renal function.

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[5] von Lichtenberg, A. and Swick, M.: Klinische Prufing des Uroselectans. Klin. Wchnschr., 8:2089-2091, Nov. 5, 1929.

Kretschmer, H. L.: Intravenous Urography. J. S., G. and O., 51:404-408, Sept., 1930.

According to Heckenback the specific gravity rises at first to 1050 or 1060, later on falling to 1030. He concludes from this that the roentgen-ray control, after the injection of uroselectan is rightfully made, as the best radiographic presentation, must naturally in time correspond with the most concentrated excretion. Tourné and Damm have found that the uroselectan blood curve rises abruptly during the first two hours but sinks gradually during the later hours, and that no uroselectan is found in the blood after four hours, where a normal renal function exists.

The coagulation time of the blood is not altered by the injection of uroselectan nor is the rapidity of sedimentation changed. Therefore, it does not appear that any special danger of thrombosis or embolism may arise following its injection.

Indications. Intravenous injection of uroselectan is indicated in those cases in which cystoscopy fails or presents difficulties, as in cases of stricture of the urethra or ureter, or where catheterization of the ureter by instrumental pyelography is not applicable or advisable, as the passage of an instrument through an infected bladder may be dangerous. Also this method is indicated in renal tuberculosis, pyelitis, lithiasis, pyelo- or hydronephrosis, prostatic hypertrophy, etc.

In children this method will no doubt prove of even greater value and importance than in adult urology, as it will add considerable to our diagnostic accuracy without resorting to instrumentation. Uroselectan may be used at all ages and requires no anesthesia, thus obviating one of the disadvantages of catheterization and retrograde pyelography in children.[6]

Contraindications. Anuria, uremia, terminal Bright's disease and pregnancy, as well as in cases weakened by generalized systemic infection.

Reactions. There is a slight burning sensation in the arm shortly after commencing the injection, followed by a feeling of "warmth," and sometimes pressure in the head. A little later there is a sensation of thirst. In our limited number of cases we have experienced no other reactions.

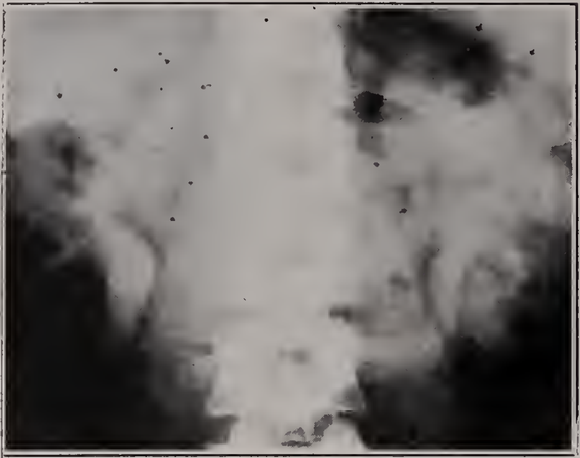

Fig. 3. Fifteen minutes after the injection of uroselectan. Bilateral pyelitis confirmed by catheterization.

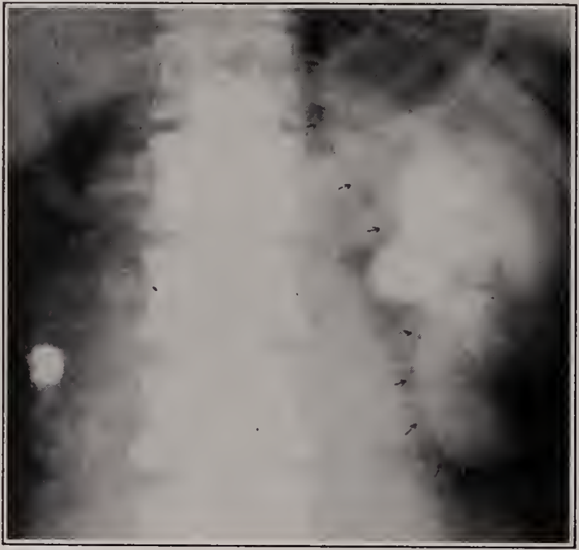

Fig. 4. Thirty minutes after injection of uroselectan. Right kidney was removed in 1923. One large stone is located in right ureter. Left kidney shows marked compensatory hypertrophy and enlargement of renal pelvis. Very slow emptying of left kidney.

The normal urogram obtained after intravenous injection of uroselectan is noticeably different from that obtained by the ascending injection of an opaque medium through a catheter, in that it appears smaller and less distorted, with no obliteration of diagnostic points through the passage of the catheter and the forcible injection resulting in mechanical distention.

A good radiographic visualization of the renal pelvices is obtained immediately or within twenty minutes after the injection, due to a flooding of the blood stream by the opaque medium. The ureters appear as faint shadows, while the bladder is quite opaque.

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[6] Hyman, A.: Intravenous Urography in the Diagnosis of Urological Conditions in Childhood. J. S., G. and O., 51:409-415, Sept., 1930.

In pathologic conditions, especially in the early lesions of renal tuberculosis and tumors, one should exercise great care. In tuberculosis uroselectan is giving very satisfactory results. The radiographs visualize, in addition to an impaired excretion, tuberculous cavities in the region of the calices and the parenchyma may be demonstrated (fig. 2).

Damaged glomeruli give very poor or no shadows at all, especially in cases with purulent infection of the parenchyma (fig. 3). On the other hand, Swick reports that clean obstruction in tubular destruction even in far advanced stage, will give good shadows on the radiograph.

The most easily readable radiographs have been obtained by the author in cases of hydronephrosis and hydroureters (fig. 4). In cases of unilateral involvement it has been found that the side affected stands out in marked contrast to the normal side. Congenital anomalies may easily be demonstrated by means of uroselectan injection.

Though this method of intravenous injection is now employed practically all through our country and abroad, only one case of fatal result has been reported in the American literature. Therefore, the author feels it justifiable to quote this case of Riebel and Riebel[7] for its particular interest and lesson it teaches us in this new field.

The case was a white male, 53 years old, who gave a history of diabetes and for two months had had a series of furuncles. Apparently both the diabetes and the furuncles had received indifferent treatment.

On examination there was found a large furuncle over the seventh left rib and another over the right rib posterior. Palpation gave a sense of resistance over the latter area, although a mass could not be definitely outlined. Roentgenogram of the kidneys revealed moderate, uniform enlargement of the left kidney; the right was not visualized. However, while the lateral margin of the left psoas muscle was well defined, that on the right was very faintly visualized and appeared compressed medially. The lumbar spine was flexed to the left.

A diagnosis of probably perinephritic abscess was made. Cystoscopy was performed but, because of intense inflammation, the ureters could not be located; therefore, uroselectan injection was considered advisable. Shortly after injection the patient had a chill and temperature rose to 105°, pulse 160 and weak. Roentgen-ray films disclosed the presence of a little of the opaque solution. An incision in the lumbar region over the right kidney disclosed an abscess containing thick pus; another incision over the left midaxillary line released pus from the other abscess. The patient died shortly after.

This case report is of importance, as it demonstrates that the death of a patient previously weakened by infection was no doubt hastened by the use of uroselectan.

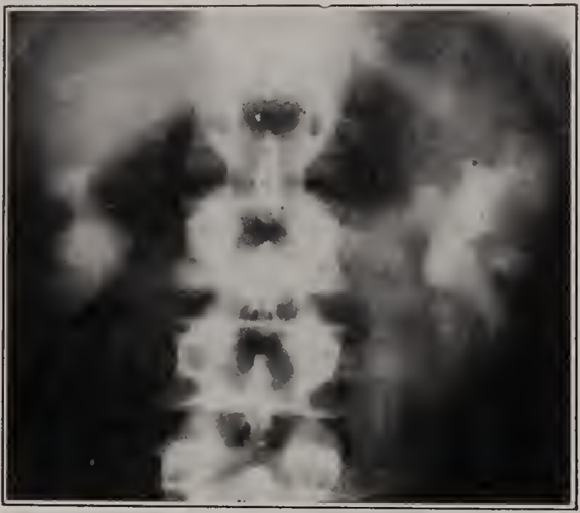

Fig. 5. Right hydronephrosis with presence of stone. Slight dilatation of right ureter. Left renal pelvis commences to show tendency to hydronephrosis. Thirty minutes after injection of uroselectan. (Compare this with fig. 6.)

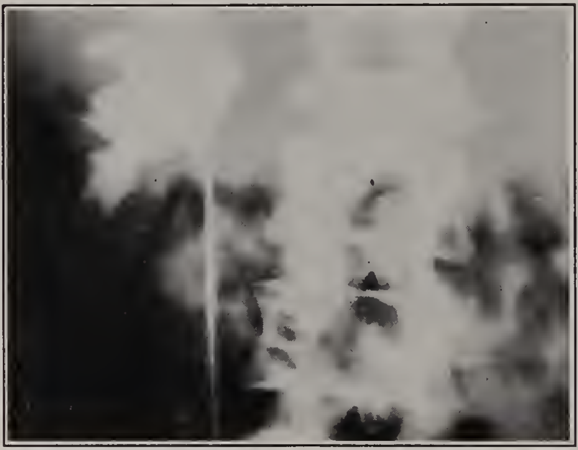

Fig. 6. Same patient as in fig. 5. Retrograde pyelography with ureteral catheter in situ and injection of 25 cc. of 25 per cent sodium bromide solution. In comparison with fig. 5, visualizing the stone, the sodium bromide solution is too heavy and obscures the stone in this film. Therefore, it is of importance to use a solution which will not obscure pathology.

The future effect of this development on the art of cystoscopy and ureteral catheterization is rather dubious, for it is evident that, with the inevitable perfection of the intravenous method, catheterization of the ureters may probably become as obsolete as laryngeal intubation or similar procedures of the past.[8] In other words, intravenous urography will probably replace catheter pyelography as a method of choice in urologic diagnosis (figs. 5 and 6).

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[7] Riebel, J. A. and Riebel, F. A.: Fatal Result from Use of Uroselectan. Radiol., 16:380, March, 1931.

[8] Hirsch, I. S.: Urography by Uroselectan. Radiol., 15:480-486, Oct., 1930.

It goes without saying, of course, that intravenous urography cannot replace the catheter for determination of blood and pus nor for the segregation of the kidney urine. It may, perhaps, replace catheter pyelography and attain the status of a renal function test in a great number of cases, but, it will *not* do away with ureteral catheterization entirely.

CONCLUSIONS

The conclusion has been reached by this time, that intravenous injection of uroselectan is of considerable value in the study and diagnosis of a great many urologic conditions.

It has demonstrated its ability to visualize the following: (1) The extent and character of dilatation in the renal pelvis and calices, as well as in the ureter, (2) the deformity accompanying renal infections and tumors, (3) congenital anomalies, (4) through radiographic appearance, it permits the elaboration of new methods for the estimation of the functional disturbances of the urinary system.

In closing the author wishes to emphasize that, although in many cases the use of intravenous injection of uroselectan may render cystoscopic examination unnecessary, nevertheless its interpretation should very often be accompanied by cystoscopic data before a complete or final diagnosis is made. Furthermore, the intravenous method should always precede instrumental pyelography.

VULVOVAGINITIS PRURITIC TRICHOMONALIS*

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Protozoology is a very interesting branch of zoology and several of the protozoa, which you will remember are single celled animals, are of great importance in medicine. The plasmodia, the amebas, the trypanosomes and the treponemae, often called spirochetes, are among some of the best known. It is interesting to note that organisms against which we have real specific remedies are nearly all protoza. The classification of the treponema pallida is still in dispute, Schaudin and other authorities insisting that it is protozoon, while Noguchi and Novy insist it is a bacterium. Other authorities insist that it has characteristics of both and should be placed in a classification called protista. The mastigophorae are those protoza having whip-like flagella and the trichomonades are those having four flagella. So far we have three definite divisions of the trichomonades, viz., trichomonas hominis, trichomonas vaginalis and trichomonas buccalis. Some investigators wish to add trichomonas pulmonalis but most zoologists believe that all the trichomonades are identical and that the culture medium of each habitat influences the size and development.

Morphology. The body is very changeable in life; fusiform, pyriform up to subspheroidal in unfavorable conditions. It is often ameboid, spinning out a long caudal process. It has four anterior flagella arising from a central stem. These are used to whip food into the stoma. It has an undulating membrane, extending spirally around the body from the anterior end, two-thirds the length of the body. This is the organ of locomotion.

Dimensions. Trichomonas vaginalis is the largest of the three varieties, the body being from 15 to 25 microns in length by 5 to 20 microns in largest transverse diameter. You will remember that red cells are 7.5 microns in diameter. The flagella are about three times the length of the body. Trichomonas hominis is about two-thirds this size and trichomonas buccalis is between.

Life history. Little is yet known of the life history of this parasite. No sexual reproduction has been discovered and the encysted stage has never been demonstrated. Multiplication by binary fission has been observed according to some writers.

Habitat. This parasite flourishes best in acid debris mixed with a little blood serum. It does not grow well in artificial media but may be grown for sometime in ascitic fluid and also in Locke's fluid, to which a little blood serum has been added. In the body it is found in the vagina, where it reaches its largest size; in the bladder and, if we accept its identicity with trichomonas buccalis, in the mouth.

The mode of infection has not been determined, although the most plausible theory is that it is water borne, but whether it enters by way of the alimentary canal or directly by contact with infected water has not been proven.

It is found in the vaginae of 10 to 40 per cent of the women examined in various clinics. The greatest incidence is in the vicinity of the eastern Mediterranean.

Clinical significance. My first introduction to trichomonas was many years ago when at the end of a semester, that great zoologist, Henry Baldwin Ward, after whom so many parasites have been named, announced, "You will now pass to the microscopes on the tables before you and identify and classify what you find thereunder." Little did I think then, that I should encounter the little beasts again as I have done.

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* Read before a meeting of Seattle Academy of Surgery, Seattle, Wash., March 20, 1931.

My second vital contact with this mastigophora was about five years ago.

Case 1. A woman came to me complaining of an itching vulvitis which was so intense that she had scratched herself raw. She said that attacks had occurred frequently for seven years and she could get no permanent relief. I took a careful history and gave her such relief as I could. She was better for a few days and then it recurred. I made vaginal smears and found nothing intriguing except trichomonas. She complained of urinary frequency and the urine was again examined. My nurse had previously called attention to the number of urines which contained trichomonas vaginalis and she recorded in this case an unusual number from the bladder.

I continued with the vaginal treatments and after catheterizing the bladder made an instillation of silver salt solution, repeating this daily for three days. To my surprise the itching began to leave earlier than the bladder symptoms. I waited three days and then gave three more daily silver instillations. Following this no more trichomonades were found in the urine. A smear was made from the rectum and trichomonas found. A rectal instillation of silver solution was also made and then once weekly for three weeks silver was instilled into bladder, vagina and rectum. One year later she returned with a slight itching. Three silver instillations were made into the bladder only, and she has had neither cystitis nor pruritis since, over four years ago.

From then on to date every complete physical examination has included a vaginal, rectal and urinary examination for trichomonas. This is done by introducing a cotton covered applicator into the rectum and one into the vagina, each being dropped into a test tube containing an inch of warm physiologic saline solution. The bladder is catheterized into another tube after voiding, and these three tubes are gently centrifuged.

We found trichomonas in the bladder in 27 per cent, in the vagina in 11 per cent and in the rectum in 10 per cent. In the laboratories of Providence and Columbus hospitals and in the specimens received by the Laboratory of Clinical Medicine, trichomona was found in female urine examined in the regular routine in only one per cent. However, many of these specimens were from the kidney pelvis, and specimens from every woman admitted to the hospital were examined. The cases coming to my office were gynecologic cases, so the incidence was of course much higher. Furthermore, trichomonas is difficult to identify in the cold specimen and the ordinary technician reports their presence only when motility or flagellate activity is observed.

Following my experience of five years ago, I began to examine all cases of vulvar pruritis for trichomonas in the bladder and almost invariably found the parasite. Instillation of neosilvol 25 per cent solution in the bladder three days in succession and then once a week for three weeks nearly always cleared up the trouble. No vaginal treatment was given. A few cases required a second course but never more.

In cases of cystitis, in which trichomonas was found in the bladder, the same treatment is given with the same satisfactory results. I always strongly alkalinize the urine as the trichomonas does not thrive well in an alkaline medium. The bladder should be completely emptied before the 25 per cent neosilvol is instilled. I tried many different solutions in the bladder but got the most satisfactory results with 25 per cent solution of neosilvol.

In my first hundred cases of either cystitis or pruritis with trichomonas present I gave no other treatment than the bladder instillations and alkalies by mouth. In every case trichomonas rapidly decreased in the vagina and soon none could be found. After these hundred cases, which firmly convinced me that the bladder is the residual habitat of trichomonas, I then gave vaginal treatments concurrently to hasten the disappearance from the vagina.

This consisted of an alkaline scrubbing of the vagina and the insertion of a tampon saturated with 25 per cent neosilvol solution. Nearly always this cleared the vagina of trichomonades. For cleansing the vagina I use one part of lavoris in three parts of water and the patient is instructed to take a daily douche, using one ounce of lavoris to one quart of warm water.

There are of course many leucorrheas not due to trichomonas vaginalis and I am not advocating this treatment as a cure for leucorrhea.

Following are two typical cases.

Case 2. Mrs. J. Q. September 2, 1927. Married woman, 32 years old. Height 66 inches, weight 165 pounds. Family and past history irrelevant except an operation for appendicitis and a two-inch fibroid. Menstruation normal. General physical examination negative.

Ten years ago, just before her operation, she had blisters around the vulva. These were accompanied by an intense vulvovaginal itching. Several times a year since then the intense itching has returned, to disappear under treatment by vaginal instillations and douches given by competent doctors in several states.

The present attack is so severe that the patient has scratched the skin and mucous membranes in and around the vulva until there was bleeding in many places. For treatment, one ounce of 25 per cent solution of neosilvol was instilled into the bladder and unguentum resorcini composites was applied to the vulvar region. After three daily and three weekly treatments no trichomonades were found in the urinary sediment and there has been to date no recurrence of the itching.

Case 3. Mrs. R. T. October 11, 1928. Married woman, 27 years of age. Height 61 inches, weight 115 pounds. Family and past history irrelevant except for cesarean delivery for breech presentation and one induced abortion five months before present consultation. Menstruation normal. General physical examination negative except for a small fibroid on the left side of the uterus. Centrifuged suspensions from the bladder, vagina and rectum were each positive for trichomonas.

Three weeks ago an inflammation began in the vulva, accompanied by intense itching. Her family physician gave her the usual treatment but to no avail, the itching increasing until it was almost unbearable.

For treatment one ounce of 25 per cent solution of neosilvol was instilled into the bladder daily for three days, then alternate days for three more treatments. The silver was also introduced into the vagina and rectum. The itching ceased for six weeks, when it reappeared and the patient returned for treatment. Three more instillations relieved the itching but the patient was instructed to return in one month. She returned in six weeks, at which time no trichomonades were found, but three daily instillations were made into the bladder. There have been no further symptoms to date.

SUMMARY

1. Trichomonas vaginalis is a protozoon parasite closely related to definitely pathogenic organisms.

2. Trichomonas vaginalis may or may not be pathogenic to its host.

3. Trichomonas vaginalis is a water-borne parasite, finding its most favorable culture field in the vagina.

4. Trichomonas vaginalis enters the bladder by the urethra from the vulvovaginal tract and makes the bladder its residual habitat, from which it may repeatedly infest the vagina and vulva.

5. The treatment for trichomoniasis is the destruction of the parasite in its residual habitat, the bladder, by repeated instillations of 25 per cent neosilvol.

621 Medical and Dental Building.

A FEAR NEUROSIS

J. Allen Gilbert, Ph.D., M.D.
PORTLAND, ORE.

The subject of the following history was a man, aged 22. His physical condition, as reported by the physician who referred him was negative so far as organic pathology is concerned.

During the past three months there had been a gradual onset of an indefinite fear which finally culminated in an acute exacerbation which drove him to his family physician. To be referred to me only exaggerated his fears which were already overwhelming him with an undercurrent of suspicion that he was losing his mind. When he learned that I was a psychopathologist, his symptoms increased to such an extent that he was totally unable to come to me on his own initiative. His sister accompanied him to the office of the family physician. He was only induced to come to me by the physician accompanying him. With difficulty he was induced to enter the consultation room. Sufficient confidence was finally induced so that the sister and his physician could withdraw and leave him with me alone.

As would be expected, he was from a refined family decidedly above the average in the niceties of social life. Well educated. Had planned his life for the foreign diplomatic service. Failed in his preliminary examinations and turned for the time to teaching in an isolated, lonely small town in one of our western states.

About three months previously, while teaching in the above town, he was stricken with an arthritis of sufficient severity to incapacitate him and drive him to a sanatorium, where he was rather shocked by the continual nurse parade in the administration of sedative hypodermics. Whether this neuritis was of organic or functional origin raises some doubt, with the probability in favor of the functional origin to escape the balance of the school year. Be that as it may, the neuritis disappeared with the closing of the school term and he did not go back to the same position.

During the hour, Saturday, he was extremely nervous but gratifyingly cooperative in the analytic work. Before entering the office he insisted on knowing whether I would give him some morphine or alcohol to quiet him. On being told rather positively that he would get nothing of the kind in my office, his resistance increased, but as stated, this gave place to hearty cooperation.

After a rather hasty and fragmentary anamnesis it was evident that he was rendered more fearful by direct questioning. More as a matter of curiosity on my part than as a systematic routine, I picked up my stop-watch for the application of some "Zurich association tests." He had had a six months course in educational psychology. When I picked up the stop-watch he became very nervous and said, "Now, I suppose I am going to be tested." His whole attitude became that of a frightened animal, looking about helplessly for a place to escape. Requested that he be taken into the open air. In his associations his reaction time was very short and regular. After giving him probably a dozen irrelevant stimulus words, I threw in "fear." A sort of sickly smile came on his face and after struggling for five seconds for a response, he gave it up and said, "You cannot get a word for anything like that. It hasn't any opposite." His associations were always opposites wherever it was at all possible, e.g., big-little, long-short, black-white, et cetera.

For the interim, until the next consultation hour on Monday, a definite program was laid out as to how he was to spend his spare time, for example, cutting the grass on the lawn, going to a party that was already in the offing, et cetera. He left under charge of his sister who returned to see him home. On approaching the elevator he resisted entering it and reappeared at my office door, pleading that he simply could not go out on the side-walk, even in the company of his sister. Under rather dogmatic insistence from me he finally went home and carried out more or less accurately the program laid out for him.

To my gratification, on Monday he returned to my office without company. Then followed a rather remarkable half hour.

The anamnesis of the hour on Saturday revealed the fact that he always had to keep alcohol in the house, not because he used it habitually, which he did not, but as affording a feeling of safety in case he should go into one of his nervous fear paroxysms. Alcohol would relieve him. Furthermore, his history showed that, whenever he felt one of these nervous attacks coming on, he immediately wanted a trained nurse with him. A male nurse would not do. I then started him on a systematic course of associations. On asking for associations connected with alcohol, the first picture that came up was of an experience some years ago when he stood and drank alcohol and enormous quantities of orange juice. He prolonged the drinking of the orange juice to excess as an excuse for staying to talk with the girl who was selling it. "Did he have any love affairs in his life?" "Yes, lots of them, but they do not last long. In two or three months they all subside and disappear." His love life lacked depth. He had arrived at the conviction never to marry.

During treatment he would spasmodically and feverishly light a cigarette. On Monday I said to him abruptly, "What do you smoke for?" He gave me a rather surprised and silly look and with a sickly grin, which has become somewhat habitual with him, he said, "Why it's perfectly evident. I smoke just to get away from myself. I don't want them. Saturday I smoked two packages and a half and they were disgusting to me but I went on smoking." Later in the hour, when he attacked another cigarette, he said, "I guess my cigarettes are my trained nurse when I cannot get the nurse." He is afraid of being alone. Thinking of previous paroxysms of fear tended to bring on a recurrent attack.

One of the most surprising elements of the analysis came out when I asked him if he had obtained any dreams for the hour. "No. I slept soundly all night and so far as I know I did not wake up enough to write any down. In the morning I could only recall a hazy affair about two doctors. One of them had on a green suit." By way of calling out an association I said sharply, "green." "Nasty. I despise green above any other color."

The symbolism of green is well known to art and its significance as a symbol is apropos to the general *status quo* of my patient. However, by fortunate coincidence, I did not push further associations along the line of green, but said, "clothes." Answer, "Suit. Green suit. My first suit with long pants was green." "Did you like it?" "Yes. At the time I thought it was great, but in later years I grew to despise green above any other color. Yellow is one of my favorites."

The use of yellow as opposed to green is well known. Even symbolically it is probably not without significance that classic or Apollonian art made practically no use of the greens and blues but turned decidedly to the yellow in their circumscribed psychologic horizon. But in my patient resort to echoes from ancient cultures and symbols is entirely unnecessary for out of his own personal present-day associations comes the underlying symbolism of his neurosis. "What do long pants mean to you?" "Growing up." "Which one of the doctors had on a green suit?" "Don't know. It was all so hazy that I cannot get any definite picture." There is little doubt that those two doctors were symbols of his family physician who brought him to me and myself.

We urged upon him his personal responsibility and a definite program. Inasmuch as green represented responsibility, it is natural symbolically that we should be clothed in green. Furthermore, inasmuch as "green suit" meant growing up to him, it was natural that it should be worn with pleasure as a child when ambition and desire to grow up were the program of the day, later to be displaced by fear and dread in the face of responsibilities he felt incapable of meeting.

Two hours' work revealed to my patient so thoroughly the general etiology of the neurosis that he expressed a desire to see whether he could not meet the issue on his own hook. In this he was encouraged and no appointment was made for a subsequent hour.

The situation was somewhat unusual in the promptness with which the neurotic picture developed itself and the personal attitude of the patient toward readjustment on the basis of the new data obtained. An optimism which sees a complete cure of the neurosis in such progress merely courts disappointment. What such a condition usually needs is a complete synthesis of his life on the basis of a complete analysis, but he was thrown back on his own resources tentatively for the encouragment involved as well as for the basic principle of personal initiative as an essential in character building. However, he went on to rapid improvement, took up active interest in the outside world, identified himself with the commercial world, became engaged to marry and is at present in active service with apparently no trace of the fear.

The case is not reported as an instance of rapid and complete cure but as representing a brief, concrete example of the *modus operandi* of an unusually clean cut neurosis in its submission to the analytic method. Unless a neurosis is worked out in all its ramifications by analysis with an accompanying synthesis, recurrences under special stress should be no ground for surprise. In every case, a neurosis is a faulty individuation process, in which the victim fails to adjust to the conditions in which he is thrown.

BRIEF SUMMARY OF DATA

Decided attitude of attempting to escape the realities and responsibilities of life. Practically everything he did was with the aim of shifting responsibility; e.g., the neuritis as an escape from teaching; his ineffective love affairs which always terminated when they became sufficiently serious to represent responsibility; choice of foreign diplomacy for a life work; after cure of the neurosis a preference for and adoption of active commercial life. Love now went to its natural fruition; long pants as the symbol of responsibility; green as an aversion in that it represented responsibility; aversion to green as a direct association with "growing up." Direct association of green and long pants, both meaning the same thing. Green in the world of consciousness signifies a vision, a broader horizon, depth, atmosphere, space, distance, comprehensiveness, from all of which my patient shrank with an uncontrollable dread. The nurse (who must be female) as a nucleus for shifting of responsibility; the excessive drinking of orange juice to afford female companionship for the price of the orange juice; the cigarette smoking purely as an escape from himself. The doctors in his dream as symbols of dictatorial authority, one dressed in green; attacks of fear frequently heralded by weakness of the legs; intimate identification of fear with responsibility; alcohol as a defense against his fears.

The last of the above data probably deserves more than a passing notice. When analysis was turned upon acohol as a symptom in the neurosis, the first association that came to him was being at the home of the sister of his at-the-time sweetheart. The association was very definite in indicating an impulse he had at the time to go to the kitchen to mix a drink. On the way his legs got so weak he could scarcely walk. His sweetheart had had some alcohol, became talkative and in her talk spoke of the possibility of their marrying. Eight or ten associations all led directly to the girl and her associations with him. She is in love, with definite aims in view. He is not or, at least is afraid to be.

It gave patient great relief to have dug out all the associations. Went to the girl, discussed the situation in detail, went home, "slept like a log" all night and felt perfectly fine in the morning. Met the girl again that day, talked over the affair again and settled on the plan of keeping on with their friendship as before but with the understanding that marriage was not to be a part of the program. On leaving her his left leg became so weak that he felt he could not walk right and he hurried to my office at an unusual time and without an appointment.

Associations showed plainly that he had come to my office as a refuge. When I suggested that in settling it as he had he had probably not satisfied his self-respect both consciously and subconsciously, he acquiesced in the opinion and the weakness in his leg increased to such an extent that he found it difficult to go on to his brother-in-law's office as he had planned to do. At his request the girl came to my office. She realized fully that he was in a flight from reality and had her female "hunch" that he was in love with her but would not confess it to himself. The affair broke up entirely, details unknown. Later, after I learned of his engagement to another girl, I met her in the elevator and with great pride she pointed out her engagement ring and announced her engagement to another man.

Possibly the Freudian enthusiasts might exult over such facts as a demonstration of the ultimate sexual nature of the whole neurosis. On the other hand, the whole picture forces one into the conviction that the libido in the Jungian sense has been blocked and sex, like everything else, has suffered in the process. The man was simply trying to live in a phantasmal world freed from responsibility, and shrank from the world of reality with all that it represented.

DIATHERMIC TREATMENT OF GONORRHEAL ENDOCERVICITIS

REPORT OF EIGHTEEN CASES *

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New methods of treatment and a large part of the experimental work in medicine are developed in the large clinics and medical centers. Contact with highly trained colleagues and an accessibility of an abundance of clinical material encourages new methods. It remains for the men who are not privileged to carry on work in an experimental way to tabulate their results in the various methods of treatment so that in review they may show others and satisfy themselves that some one method is the one of choice in their particular field and locality. In consideration of this subject I bear in mind that success with us may spell failure for others in another locality. Not that we have developed any new or superior technic but because it can be effectively applied to a certain type or class of patients.

For a few years general surgery was a part of my lot and it was not an unusual thing in the course of a year to resort to a salpingectomy or an amputation of the cervix to effect a cure in a gonorrheal salpingitis or endocervicitis. In these instances our less drastic measures had failed. These as a rule consisted of hot vaginal douches, topical applications, foreign proteins and vaccines.

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Summing up, our results were not satisfactory in light of the fact that young women had been subjected to operations which would render them sterile.

Diathermy of the cervix as defined by Mikels[1] is the application of heat in the tissues with the production of a sufficient degree of temperature to produce coagulation, desiccation or carbonization. As practically all are familiar with this type of treatment, a word relative to the apparatus will suffice. The Corbus electrode[2] with thermometer and an indifferent electrode, coupled with a high frequency machine, constitute the apparatus.

It is well to remember that the cervix is about an inch long, limited distally by the external os and proximally by the internal os. The canal itself is lined by mucous membrane about one millimeter in thickness. It presents a longitudinal ridge in its anterior and posterior surfaces, from which a large number of folds or rugae branch off obliquely and laterally. Connecting these two ridges, the epithelium of the isthmus is of the low columnar or cuboidal type. Advancing toward the external os, the epithelium becomes the high ciliated columnar variety. At the junction of the middle and lower third of the cervical canal, the simple columnar epithelium undergoes a transition to the stratified variety. There is a definite basement membrane below the entire epithelial layer.

Scattered throughout the mucous membrane are many tubular glands about one to two millimeters long, but the racemose variety predominates. The ducts open into the cervical canal. The glands usually stop at the basement membrane, although some extend beyond this structure, the depths from the surface being about three millimeters or about one-eighth of an inch. Approaching the external os, the glands become fewer and more shallow and it is conceded that infection rarely if ever originates in this particular location. The main cervical arterial supply is near the isthmus and removed from the diseased mucous membrane. From the foregoing it is seen that penetration is needed, since some of these glands even penetrate beneath the basement membrane or deeper than one-eighth of an inch.

Medicaments have proved unsatisfactory, unless it is silver nitrate which does not penetrate but destroys. Heat at the present would seem to be the only logical method, either as cautery or diathermy. In case of a concurrent salpingitis, treatment of the cervix alone is seldom satisfactory.

It has been proved that a temperature of 106° F. will destroy the gonococcus but it requires a higher temperature to destroy the other pyogenic organisms found in the lesions. It seems logical, then, that any electrode that will contact the whole mucous surface of the cervix and radiate a constant, controllable heat would destroy all organisms that might be located in the radius of one-eighth of an inch from the mucous surface of the canal. It would also be desirable to have heat radiating down through the adnexa from an indifferent electrode placed on the lower abdomen.

A homely experiment was carried out by us in an attempt to see the results of this radiation of heat. A large piece of very tough beef neck, sixteen by eighteen inches square was placed on an indifferent electrode, while the active electrode was thrust into the surface of the meat above at a slight angle to the lower electrode. The current was turned on and maintained at 120° F. for forty-five minutes. It was noted that the milliameter had to be kept at about one-half the reading required in the living to maintain such a temperature. Sectioning the meat at the distal and proximal ends of the electrode, the meat radiating for one-fourth of an inch in all directions was slightly whitened. The distal section appeared about the same as the proximal end. It has been demonstrated in living tissue that the proximal end attains sufficient heat, for we have had sloughs occur when the temperature was carried to 120° F.

Our method of treatment is as follows: After the bladder is emptied, a bivalve speculum of sufficient size to permit good vision is used as a vaginal retractor. The inactive electrode of lead foil, twelve by fourteen inches, is placed above the pubes. The vagina is swabbed out. In event there is a heavy, mucopurulent discharge, we gently remove this. Many times we do not clean the cervical canal, especially if there is a purulent discharge, as the trauma of swabbing with applicators may provoke bleeding. It is well to determine the position of the fundus before any attempt is made to place the active electrode. A tenaculum may be necessary to steady the cervix, while the electrode is introduced into the canal, full to its shoulder. The electrode should be thoroughly engaged in the canal to prevent extracervical burns. For this reason, also, it is well to have an attendant sit and hold the electrode throughout the treatment so that it will not be displaced.

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[1] Mikels, Frank M. Diathermy Treatment of Uterine Cervical Lesions. Arch. Physiotherapy, 10:481-486, Nov., 1929.

[2] Corbus and O'Connor: Diathermy in the Treatment of Genitourinary Diseases, 1929.

CASE NO. AGE, DATE	TYPE OF INFECT.	OTHERS INFECT.	TEMP.	REACT.	COMPLICATIONS	NO. TREAT.	RESULT	TIME UNDER TREATMT.	FINAL
123-S-21 3/29/28	Muco-purulent g.c. 3 plus	No	106 112	None	Salpingitis Bartholonitis	12	Cured	2/2/29 387 days	1/7/31 N
90-M 4/7/28	Muco-purulent g.c. I plus	Yes	106 116	Severe cramps	Mass right pelvis	14	Cured	3/25/28 351 days	1/12/31 N
244-S-21 6/20/28	Purulent g.c. I plus	No	110 114	None	None	21	Cured	1/24/29 228 days	1/13/31 N
249-W-30 6/23/28	Muco-purulent g.c. Neg.	Yes	110 112	None	None	5	Cured	11/28/29 158 days	2/7/31 N
245-W-34 6/16/28	Muco-purulent g.c. Neg.	No	110 112	None	Salpingitis Lac. cervix	14	Unimproved	8/7/29 419 days	
293-M-25 7/23/28	Purulent g.c. ?	No	110 114	None	None	9	Cured	1/4/29 180 days	1/19/31 N
347-M-30 8/30/28	Muco-purulent g.c. I Plus	No	110 112	None	None	5	Improved	11/21/28 113 days	
419-W-25 11/8/28	Purulent g.c. I Plus	No	110 112	Severe cramps	Venereal warts	6	Cured	6/5/29 195 days	
426-S-21 11/10/28	Non-purulent g.c. I Plus	Yes	110 114	None	None	5	Married ?	2/28/31	
433-S-19 12/13/28	Purulent g.c. Plus	No	112 114	Severe cramps	Small vagina	9	Improved Neg. g.c.	3/5/29 67 days	
482-S-19 1/7/29	Slight discharge	Yes	110 116	Severe cramps	None	7	No discge. Neg. g.c.	1/7/30 349 days	
554-W-40 2/20/29	Purulent g.c. II Plus	No	116 118	None	Salpingitis	6	Cured	5/25/29 106 days	
640-S-20 4/27/29	Purulent g.c. I Plus	No	110 116	Cramps	Rheumatism	8	Cured	8/17/29 136 days	1/16/31 N
848-M-28 9/27/29	Purulent g.c. I Plus	Yes	110 120	None	None	3	Cured	12/2/29 90 days	
1056-M-27 3/6/30	Muco-purulent g.c. I Plus	Yes	110 116	Severe cramps	Hydro-salpinx	6	Operated	2/18/31 349 days	2/18/31
1232-S-19 7/9/30	Purulent g.c. I Plus	Yes	114 120	Cramps	Trich. vaginalis	3	?	8/19/30 28 days	
1354-M-34 10/9/30	Purulent g.c. I Plus	No	110 118	None	Salpingitis	4	Chem. pure	2/14/31 127 days	2/14/31
1210-M-30 10/25/30	Purulent g.c. I Plus	No	112 114		Salpingitis	2	Operated ?	2/17/31 115 days	2/17/31
18 Patients	13 Pos. S 5 Neg. S	12 No 6 Yes	Av.L110 Av. H 115	Reac. 8 None 10	Comp. 11 None 7	Av. trt. per Pt. 8	Cured 10 Not cured 8	Av. days treat. 181	

The current is turned on gradually for the first ten to fifteen minutes until the required temperature is reached. One has to be guided at times by the amount of discomfort the patient experiences. As a rule, the cramps and backache increase in direct ratio with the temperature. In some instances we have found it necessary to use morphine as in a preoperative case. As a rule we employ a temperature ranging from 112° to 114° F., while in others, where secondary infection has intervened, we have used as high as 120° F. for thirty minutes. At the end of the treatment decrease the temperature slowly over a ten to fifteen minute period The vagina is usually partially filled with a clear, serous or watery secretion and we have found that in most cases the endocervical discharge is increased for four or five days. Treatments may be carried out at five to seven day intervals, depending on the reaction of the patient and the appearance of the cervix.

We have never treated an acute cervix in this manner, usually waiting until thirty or more days have elapsed after the initial infection. A high white cell count or any indication of acuteness is a contraindication. The same applies to acute tenderness in the pelvis. The menstrual period must be considered. No treatment should be given for four days preceding or succeeding the menstrual flow. Mikels enumerates as contraindications active lues, Vincent's infection, advanced diabetes or any constitutional ailment which might retard or prevent the final healing of the tissues after the coagulum sloughs off or separates.

The complications in the series of eighteen cases have been transient, some of them trying and annoying. Recurrent salpingitis is the most serious. This has been a signal for us to stop all local treatment and employ foreign protein. We have been almost convinced in some instances that surgery was indicated and yet they recovered to journey on to a complete and satisfactory cure. The infection of Bartholin's glands usually requires incision, excision or cauterization. Conservatism has been carried out to the fullest degree. Menorrhagia, extending from a few to several days, has been experienced on some occasions. This seems to be more or less dependent on the acuteness or chronicity of the infection in the pelvis. We believe it is usually because the acute infection in the tube has not completely subsided.

In this series of cases all but one had either a purulent or mucopurulent discharge from the cervix. All were proved cases of gonorrhea, either by laboratory test or the history of infecting others. The average temperature ranged from 110° to 115° F. Seven had complications, ranging from Bartholinitis to rheumatism; one was relieved of the rheumatic condition by diathermy; ten were cured, both from laboratory and clinical standpoints. Of the eight remaining, four had normal appearing cervices and adnexa when discharged from the office but failed to return for final examinations. One was unimproved. She was under our care for four hundred and nineteen days but was very irregular with her treatments and very unconcerned, although she had the most profuse and foul endocervical discharge that we have encountered. We felt that she was primarily an operative case, as the infection did not respond to treatment, also, in view of the fact that she had a bilateral involvement of the fallopian tubes. Although one patient exhibited a mass in the right pelvis that was fully the size of a small hen's egg, this mass melted away under treatment. We insisted at the start that she submit to an operation but she refused and insisted on diathermic treatment as an experiment. We gained a complete cure in this instance. We recently examined her and found a normal pelvis and clean cervix.

Two in this series were operated upon. One had persistent mucopurulent discharge and masses in the region of the broad ligaments. Operation revealed a bilateral hydrosalpinx. The cervix cleared rapidly after the salpingectomy. The other was operated upon prematurely to save domestic complications, as she was totally ignorant of the type of infection, having been infected by her husband. Four, which constitutes 22.2 per cent of the series, developed an acute salpingitis while under our care. It is possible that not enough time had elapsed to allow all acute symptoms to subside before local treatment was instituted. Possibly it would have been safer to have treated the newly acquired infections with foreign protein over a period of time in the hope of avoiding such complications.

Regardless of the type of treatment, some of these infections have appeared more virulent than others. This is a true virulence of the bacteria or due to a lack of resistance of the patient. Some acquire ascending infections more quickly than others, even in the face of most conservative treatment and care. The average number of treatments per patient was eight, while an average of one hundred eighty and one-half days was required as the length of time they remained under our care.

It can be seen from the foregoing that gonorrheal endocervicitis is a chronic disease. The patient should be fully informed as to the probable length of time necessary for treatment, the possible complications that might arise and the possibility of failure in this method of treatment. It can also be seen that it requires in the main an intelligent and cooperative patient.

CONCLUSIONS

Diathermy of the cervix is indicated in chronic gonorrheal endocervicitis. It is especially fitted for a certain class and type of patient. The patients are ambulatory. There is a possibility of their not being rendered sterile. It has a pronounced effect on infected fallopian tubes. Finally, the percentage of cures justify its use.

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SURGICAL PROGRESS IN 1930*

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Various interpretations of what is progress in any one year are usual and permissible. In surgery the scope is big and the selection delicate in proportion. The following selection is rather one of ripples than of the deeper currents which require volumes for their description. New practices are not necessarily progressive and in the same way it may mean advance to substantiate from time to time well known and seasoned methods. Brevity has been the constant aim and many articles of length have been so winnowed that only a line or two is left. It has seemed fit to omit a bibliography.

Johnson and Einam treated forty-three patients with positive blood culture of streptococcus hemolyticus by means of intravenous injection of polyvalent antistreptococcic serum. Eighty per cent recovered. In a control series, without the use of serum 80 per cent died. They emphasize the necessity of precaution against anaphylaxis and the great importance of general treatment with elimination of possible foci of infection.

Barnett Joseph used insulin in doses of ten units daily for indolent ulcers, especially of the sacral-decubitus type. The rapid improvement was noteworthy.

S. P. Reimann used thiocresol in 1 in 10,000 alcoholic solution to stimulate wound healing in indolent ulcers. It proved most effective.

Phelps attempted to evaluate cardiac and circulatory stimulants for surgical patients with the following results: Epinephrin increases cardiac output for seven hours, while caffeine diminishes it. Camphor-in-oil depresses cardiac musculature while ephedrine stimulates accelerator mechanism. Large doses depress the heart muscle and cause a fall in blood pressure. Pituitrin constricts all blood vessels but dilates the heart to a high degree, and strychnine has no tonic effect on the heart. The use of insulin in shock is harmful. Digitalis is a cardiac tonic in adequate dosage and a general vasoconstrictor. Its action is dependable, pronounced and sustained.

Rankin and Palmer employed radium for postoperative parotitis. Its immediate application is important, using it eight hours in sixteen for four doses. The mortality and incidence of suppuration was greatly reduced. Twenty cases out of seventy-eight had followed colonic surgery.

Ude and Platon treated four hundred patients with erysipelas by roentgen-ray, ultraviolet ray or antitoxin. Each method was equally satisfactory, although a combination of methods was still more effective. Clinical arrest occurred in 92 per cent after the first treatment.

Butler, Fenney and Levine studied postoperatively one hundred and twenty patients with heart disease. They found the risk not appreciably increased except where complicated by coronary thrombosis or nephritis. Conditions, such as myocarditis, angina, fibrillation, paroxysmal tachycardia and decompensation, were included in the study.

Graham employs cardiolysis with increasing frequency, where cardiac decompensation or other cardiac difficulty results from adhesive pericarditis. A typical syndrome is not necessary as an indication for operation which consists in a decompression by removal of ribs anteriorly.

Smithwick and White relieved pain in obliterative vascular disease of the lower leg and foot by alcoholic injection of the sensory nerves after direct exposure. Treatment for ulceration was then more easily carried out and narcotics became unnecessary. Ten per cent were thus enabled to avoid amputation and no motor interference occurred.

Jones used nupercaine in a large series for local and spinal anesthesia. He considers it the strongest and most satisfactory drug of the kind yet produced.

White considers avertin an excellent basal anesthetic. Morphine and gas or novocaine infiltration were used by him in conjunction with it. Fifteen thousand cases have been reported from Europe with bad results only where the larger dosage was employed.

Martin and Ellis used an eighteen gauge needle to obtain biopsy specimens in certain types of tumors. It was successful in 80 per cent of cases and free from danger of dissemination. Tumors of the neck, mouth, antrum, lung, breast and bone were thus studied.

Grant employed cordotomy in fifty-one patients for relief of pain. He considers the operation a distinct advance and notices that the section of pain fibres in the cord causes no distress. It is a practical, justifiable and merciful procedure.

Pfeiffer notes that prolonged administration of sodium bicarbonate has caused alkalosis with severe renal damage and uremia. He finds the urine acid in many cases, the acid solutes of metabolism passing through the kidney most readily. The blood changes are diagnostic. Treatment is by intravenous sodium chloride solution. Graham, however, urges the use of Hartmann's Combined Solution, made by Lilly and Company, as being superior and of value in acidosis as well as alkalosis.

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* Read before a Meeting of Seattle Surgical Society, Seattle, Wash., March 27, 1931.

Hendon recommends continuous intravenous injection of saline or glucose administered through a cannula for certain types of disease. Thus eleven patients with emesis gravidarum all recovered after three to five days of 10 per cent glucose injection, 5,000 cc. daily. Other conditions were staphylococcic bacteremia, in which the red cells rose over half a million in three days; intense jaundice from multiple abscesses of the liver; hemorrhage from gastric ulcer; adynamic ileus, shock and acute toxemia.

McFee and Baldbridge used massive doses of saline intravenously in patients with shock or collapse. They thus mobilized the stagnant blood cells in the capillary areas. Five hundred cc. were given in fifteen minutes and 1,500 to 2,000 cc. during the first hour, as much as 8,000 cc. being used at a single injection.

Gallie and Harris used normal saline by continuous intravenous injection in children. They select a small vein in the hand which is then placed on a splint, and continue the injection for one to ten days. As a small needle is used, glucose is not given with the same apparatus.

Denk employed diagnostic blocking of the phrenic nerve to differentiate a thoracic from an abdominal cause of pain. Ten cc. of .5 per cent novocaine was injected above the clavicle. The pain subsided only in thoracic lesions.

Lupan injected insulin for the cure of gastric and duodenal fistulae with success.

Potter uses a weak hydrochloric acid solution sometimes by continuous drip. Also a concentrated beef extract and olive-oil were applied to the fistulous opening.

Schewket in two hundred herniotomies ligated the neck of the sac, slit up the fundus and left it in situ. Brown made strips of the hernial sac and used them as living sutures after the method of Gallie. Wetherill employs upward coning of the sac stump after herniotomy by Russell's method. He considers it the operation of choice in children, and adults with good musculature.

Wilmer, Cole and Lee reviewed ten cases of atelectasis following abdominal operations and found all to be definitely allergic. The sputum was tenacious and purulent. Cutaneous tests were positive in most, either for pollen, animal emanation or bacteria. They consider lobar pneumonia an infectious lobar atelectasis and advise close inquiry for allergies in all such cases.

Einhorn uses an aspirating bougie for the detection of blood in certain suspected cases of gastroesophageal carcinoma. He notes resistance at eighteen or nineteen inches from the lips. Gastric disturbance, loss of weight and continuous cardiospasm for two or three months, especially with occult blood in the stool, are characteristic of carcinoma.

Goldsmith reports a case of bleeding esophageal varices treated by ligation of coronary veins, which ligation includes the whole of the lesser omentum well up to the diaphragm. The veins were noticed to be tortuous and dilated. No hemorrhage followed during the subsequent one year's observation. Roundtree and Walters first did this operation in 1929.

Jones and McClure found postoperative pulmonary complications greatly lessened after the transverse incision in upper abdominal surgery. They consider that the absence of postoperative pain, the infrequence of massive adhesions and a weak wound together more than compensate for technical difficulties.

Huff removed a safety pin from the stomach without gastrotomy. After exposing the stomach a tube was passed by mouth with a piece of gauze attached and the pin fastened to the gauze. In recording the history in thirty-nine children with foreign bodies in the stomach, all were passed but three, and included pins, tacks, nails, coins, clips and staples. More than half had received a cathartic without ill effects.

Lahey finds 11 per cent of duodenal ulcers are treated surgically in his clinic. He thinks handling of these organs solely by the surgeon is no longer justifiable, although sometimes all forms of treatment are embarrassingly disappointing.

Urrutia employed simple suture in seventy-seven perforations of the duodenum. Fifty per cent of these required gastroenterostomy or resection at a later date. In jejunal perforation simple closure meets the vital indication, radical treatment being a later procedure when necessary. In Gibson's service 139 cases of perforation were studied by Farr. He believes that gastroenterostomy is rarely indicated. Williams and Walsh studied 124 patients with duodenal perforation closed by simple suture. Fifty per cent required a gastroenterostomy later. With entensive induration they passed a catheter through a gastrotomy wound and fed a ureteral catheter through this into the duodenum. After three days the ureteral catheter was removed and after six days the rubber catheter.

Ginzburg and Benjamin studied postoperative biliary fistulae under the fluoroscope, following lipiodol injection. It enabled the site and nature of an obstruction to be determined, the hepatic duct to be fully outlined, or aided in defining a free passage to the duodenum. This is valuable where further operation is considered in determining the length of the remaining portion of the hepatic duct.

Lahey insists on the similarity of symptoms due to disturbance of the colon and of the gallbladder. The gallbladder may not be visualized in the first dye test but may show normal on a second, following colonic treatment. Fifty per cent of mistaken diagnoses of gallbladder disease were found to be colon disturbances. The symptoms are largely those of gastric distress and the classic symptoms of cholecystitis are absent.

Nichol and Judd studied three hundred resected gallbladders bacteriologically and found pathogenic bacteria only in the acute forms. The disconcerting consistency of positive cultures from the acute cases is only equalled by the persistent lack of growth from the chronic cases.

At the Henry Ford hospital a 2 per cent solution of calcium lactate in 50 cc. dosage is used twice daily to improve the clotting time preoperatively.

Florcken found a porcelain gallbladder in a woman of sixty-five. Microscopically it contained calcium and cholesterin in the wall. One gallbladder in twelve hundred is of this type.

Ramond and Chene comment on the radiation of pain in gallbladder disease. They emphasize the frequency with which it occurs in the occipital and left hypochondriac regions. When of gallbladder origin these pains are worse three or four hours after food and improve after gallbladder treatment. The pain in the left hypochondriac region is along the lower costal border and never as severe as in biliary colic.

C. H. Mayo believes that overwork or overfiltration of the gallbladder may explain enlarged glands along the cystic duct. Similarly adhesions from the liver to the gallbladder, duodenum or colon may indicate a chronic hepatitis, this condition probably preceding infection in the gallbladder. In such a liver the postoperative administration of glucose is imperative, as the organ is unable to accomplish its major function of handling sugar. Per contra, animals fed on meat rapidly develop ascites and toxemia, where cirrhosis is present. Removal of the gallbladder may give the needed relief of tension, where there is evidence of overwork.

Miller studied acute gallbladder disease in two hundred cases, operated upon in the Massachusetts General hospital. He found the greatest mortality with delayed operation and noted that in 50 per cent no adhesions were present. In eight fatal cases of perforation six had no adhesions. He quotes W. J. Mayo's comment that an acute appendix occasionally perforates simultaneously with the gallbladder. Therefore, he advises against delay, where the symptoms of pain, tenderness, rigidity and leucocytosis are present.

Graham advocates drainage after cholecystectomy on account of the occasional presence of accessory hepatic ducts.

Lahey urges the importance of isolating the cystic duct and the cystic artery for better exposure of the common duct and avoidance of hemorrhage from the artery. They are always separately ligated.

De Courcy advises against routine exploration of the common duct, where the symptoms do not point to involvement.

Douglas used a Mayo vein stripper to facilitate the removal of a T. tube from the common duct.

Duvall reports three cases of hematemesis where splenomegaly was present. At operation the splenic veins were found completely thrombosed. Many splenic conditions are undiagnosed before removal. Cysts follow thrombosis with pulp necrosis and many form at the surface at the site of perisplenitis. Splenic needle puncture is a valuable way of obtaining histologic and bacteriologic data for diagnoses. Cases have been recorded where a serious bleeding followed the puncture.

Auchincloss studied cases with calcified mesenteric nodes. He found these to have their beginning in children and young adults, although they may cause their symptoms at a later date. Their presence may cause a vague and indefinite type of symptom and simulate any intraabdominal disease, characterized by chronic digestive or chronic painful disorder. They are discovered by a flat roentgen-ray plate after an efficient castor-oil evacuation, and are a frequent finding in cases of so-called chronic appendicitis, where operation has failed to relieve the symptoms.

Speese and Bothe note that leading surgeons find more than 20 per cent of patients unrelieved after operation for chronic appendicitis. They advise examination of the ileocecal valve for obstruction from spasm or adhesions. Imperfect draining of the ileum produced symptoms similar to chronic appendicitis. After freeing abnormal adhesions a free omental graft was placed.

Zimmerman analyzed one hundred and fifty-nine cases of spastic ileus, a persisting contracture of the muscularis leading to obliteration of the lumen. The clinical picture is identical with that of mechanical obstruction an dthe diagnosis is usually made at operation.

Massabum records two hundred and fifty cases of appendectomy without inversion of the stump. He greatly favors this technic.

Gurd advises the use of alcohol followed by bismuth paste in the appendix incision before opening the peritoneum. Where a gangrenous or suppurative form of appendicitis is found, the resulting wall infection is minimized. In comparing a large series with controls, he found those untreated had 65 per cent longer hospital stay.

The Bigelow Clinic of Brandon, Manitoba, reports a series of a thousand and twenty-seven operations for chronic right-sided abdominal pain performed during the last sixteen years. Chronic appendicitis was the diagnosis and in every case bands of the cecum, ascending colon, terminal ileum or some combination of these were found. They claim to have demonstrated these bands under the fluoroscope by means of the barium enema. In every case the bands were thoroughly removed and the base covered with vaseline. They emphasize the importance of using hot compresses of 1 in 10,000 bichloride solution to prevent infection, as colon bacillus had been found by Carter in 68 per cent of the cases. They report cures of 93 per cent.

Hirschman advises colostomy of the transverse colon as the operation of choice in the majority of cases of left-sided colonic obstruction. He describes the technic in detail and claims greater comfort for the patient in wearing a colostomy bag or caring for the colostomy.

Gordon Watson finds rectal cancer to extend transversely by continuity until the muscle coat has been penetrated. It then extends by the lymphatics or the blood stream in 50 per cent of cases. Until the outer coat has been penetrated the growth is local, and a conservative treatment is justifiable. In three-fourths of the patients operated upon penetration of outer coat has occurred. The carcinoma that protrudes into the rectum is not usually invasive. The fixed or ulcerative carcinoma has usually penetrated. He reports a series of patients treated by radium, using it in the early case, the border line and inoperable case. The radium barrage is made through the open abdomen, the vagina, the perineum and intrarectally. Inoperable growths are sometimes rendered operable and also recurrent carcinoma after operation is favorably treated by radium.

Lahey reports a new method of operation, in which the distal end of the sigmoid is treated through the abdominal incision. At the second stage operation this is removed with the involved rectum. He claims the following advantages: (1) Sufficient delay is permissible for physical improvement. (2) It avoids implanting dead bowel in the pelvis. (3) A clean empty rectum is present at removal. (4) An efficient drainage is established immediately after removal.

So-called Medical Complications of Pregnancy. Phil A. Daly and Solomon Strouse, Chicago (*Journal A. M. A.*, May 16, 1931), state that formerly, when the emphasis was placed on the obstetric point of view, there developed a paradoxical philosophy of therapy. A case of organic heart disease or of diabetes mellitus in which a surgical condition affecting the kidney developed remained primarily a medical case with surgical complications. But a woman with organic heart disease who became pregnant immediately was treated as a case of pregnancy with medical complications. This position no longer is tenable; on the contrary, the medical side of the combination should become the paramount issue, the pregnancy the complication. In their paper they maintain this thesis, using heart disease, disturbances of the thyroid gland and diabetes as illustrative examples to prove that the pregnant woman with so-called medical complications can be better studied, better diagnosed and better treated when the emphasis is placed on the medical aspect. For the purpose of more complete medical study, a ward in the Lying-in Hospital was obtained and outpatient clinics were established both in the hospital and in the dispensaries. In the outpatient work, every patient suspected of having the slightest aberration from the normal medical aspect was referred to the medical clinic. The obstetricians made no effort to determine whether a heart murmur was organic, nor would they make decisions regarding the significance of a glycosuria or a tachycardia. In the hospital the same principle was adopted—of referring to the medical clinic any abnormality. At no time was the obstetrician out of touch with the case, but the diagnostic and therapeutic controls were in the hands of the internist. It soon became apparent that under the new regimen better therapeutic results were obtained.

Parasitic Infestation of Nose. Harold Liggett, New York (*Journal A. M. A.*, May 9, 1931), describes a case of infestation of the nose with larvae of the black carpet beetle (*Attagenus piceus* Oliv), an insect that infests carpets, mattresses and blankets. These larvae are exceptional in that they take two years to reach the adult stage. The insects were never seen in situ except on first examination by posterior rhinoscopy. But the appearance of larvae immediately following a sphenoid irrigation places them somewhere in the sphenoid-ethmoidal recess. It is very possible that the larvae lodged in the sphenoid sinus, especially since only recently closer observation of the first return flow from the right sphenoid sinus revealed a tiny parasite, small enough to have escaped notice originally. The mother beetle must have crawled in and deposited her eggs in a dark and inaccessible location.

NORTHWEST MEDICINE
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Devoted to the Interests of the Medical Profession of the Pacific Northwest
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EDITORIAL

MEDICAL MEETINGS IN JUNE

This year June is the month in which are concentrated the outstanding medical meetings which are of special interest to the profession of the Northwest. Our great national organization holds its meeting in Philadelphia June 8-12. The corresponding organization of our confreres to the north, the Canadian Medical Association, will convene at Vancouver, June 22-26. The third important assembly will be the meeting of the Pacific Northwest Medical Association in Seattle, June 22-27. Unfortunately the last two meetings partly overlap each other, thus probably interfering with the plans of certain physicians who would take satisfaction in attending both of them. At all these meetings outstanding members of the profession will deliver papers and addresses which will make them memorable and full of interest. A study of their respective programs will be profitable. While the attendance from this section at eastern meetings of the American Medical Association is always limited, a large registration is anticipated at the Seattle session of Pacific Northwest Medical Association. The program, published in this journal last month and distributed among the profession of this section, has stimulated an unusual interest. The fee for this course of lectures will be fifteen dollars. Further information, if desired, can be obtained from Dr. George W. Swift, 902 Boren Avenue, Seattle.

WESTERN BRANCH AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association is an organization comprising in its membership the public health officials of the national Government and all the states. It holds an annual meeting in an eastern section, which is always largely attended, and at which many important matters are discussed bearing on the health of the whole people. It has long been recognized that there are public health problems on the Pacific Coast which differ from those in other sections. Owing to this situation and the fact that the journey is a long one to the ordinary meeting in the East, two years ago the national organization established the Western Branch of the American Public Health Association. Last month this western organization held its second annual meeting in Seattle. The program included papers on many subjects pertaining to the health of adults and children, presented chiefly by public health officials and sanitarians from California, Oregon and Washington. There were group meetings as well as general assemblies, at which were discussed medical economics, tuberculosis, problems of school hygiene, mental hygiene, food and dairy control, child and maternity hygiene, matters pertaining to state boards of health and specific diseases of an infectious character. Thus one can readily appreciate that the program of such a meeting covers a wide range of matters in which every physician is intensely interested. This meeting was well attended by Pacific Coast representatives and the discussions accompanying each paper indicated their vital character. Meetings of this sort are well worth-while not only to the medical profession but to the public at large.

UNIVERSITY POSTGRADUATE MEDICAL COURSE

For the fifteenth year the University of Washington will hold its annual Graduate Medical Course in Seattle, July 13-17. The faculty selected for this year is one of unusual strength which will appeal to all physicians, regardless of their numbers of years in practice. The Program Committee has succeeded in securing William David Haggard, Professor of Surgery at Vanderbilt University, after efforts extending over many years to this end. It is a rare opportunity for the physicians of the Northwest to hear this wonderful lecturer on surgical topics. John H. Stokes, the great syphilographer of the country, has finally arranged his schedule, after trying for four years to accept the invitation to the University course. Probably Dr. Stokes is the best known man on syphilis in the world today. He is United States Health Service representative to all conferences on venereal problems of the League of Nations. He is so in demand as a lecturer that it is a rare treat to have him this year. His topics suggest interest for the general man as well as for the specialist. Syphilis is not necessarily a specialist's disease. It is seen and treated by all; hence, the general nature and the value of these lectures.

William Morris Piersol is one of the leading internists of the country. From a distance it looks as if the son of the famous anatomist might have a hard time living down this factor. But we are reliably informed by Pennsylvania men that Dr. Piersol has made a great name for himself as a medical teacher. Especially gifted is he along the line of diagnosis and treatment. He is far removed from being a therapeutic nihilist. His lectures should be very valuable to all branches of the medical profession. Carl Henry Davis is one of the best known obstetricians and gynecologists in the American Medical Association, having been chairman of its section on gynecology. He is the leader in the development of visual education. In other words, he is foremost in the development of the use of the moving picture in teaching gynecologic and obstetric subjects. He has a happy faculty of picking out and solving those problems that seem to be of the most interest to the general practitioner. This quartet of teachers, supported by Professors Meany, Kincaid, and Guberlet of the University of Washington, makes this one of the strongest courses that has ever been presented.

For the benefit of physicians who wish to take advantage of these lectures, it is planned to keep those in attendance busy from early morning until late at night. Especially will this be attractive to the out-of-town men. This course is established at the University as an altruistic move for the sole purpose of furthering medical education by bringing the great teachers of the country to the University campus for the benefit of all who wish to hear them. This is not an ephemeral, fly-by-night course but is put on with the solidarity of the University behind it. It will be perpetuated so long as it is attended by the physicians of the Northwest. It is the University's contribution to the medical profession in the absence of a medical school. On page 12 of this journal's advertising section will be found the complete program, giving titles and hours for each lecture as well as the order for social entertainment.

The fee for the course is $15.00, including the scheduled social events, with the banquet Monday evening. There is a good return given for the money. To the young man who has been in practice only a few years this course should be very appealing because his attitude at this critical time determines whether he will be abreast of the time and keep up to date or whether he will drift on with his knowledge acquired in the past. The older man, busy with the daily routine of an urgent practice, cannot devote the necessary time to research and study that many times he feels the call to attempt. Attendance on a medical course of this nature will serve to suply this need to a material extent. There is a great sense of satisfaction in checking up once a year, getting new ideas and keeping posted on the latest medical progress.

RESTRICTION OF ILLEGAL PRACTITIONERS

As is well known, desirable innovations in politics, medical and other spheres of action have originated in past years among the citizens of Oregon. Their method of control of medical practitioners is worthy of careful consideration. A few years ago a registration fee was established by legislative action. A similar attempt in Washington was defeated. The Oregon bill was subsequently amended to provide for the disposition of these medical fees which has been of material advantage to the profession. While 10 per cent of the sums collected are subject to appropriation for state purposes, 40 per cent is automatically appropriated to the University of Oregon Medical School for upbuilding and maintaining a circulating library of medical and surgical books and publications for the use of medical practitioners of the state. The remaining 50 per cent is to be used for payment of necessary expenses incurred under the authority of the state board of medical examiners, but any part of this balance may be apropriated to the circulating library fund upon the order of this board.

Another legislative enactment provides that on or before the first of March each year a printed list of all persons registered under this act shall be published and distributed to all registered physicians. Upon its receipt everyone is requested to report to the secretary of the board of medical examiners the names and addresses of all persons practicing medicine and surgery, whose names do not appear in this registry. Such individuals are automatically liable to prosecution as illegal practitioners. It is stated that during the period of January 1, 1930, to March 1, 1931, two hundred and fifty such cases were investigated. One individual was compelled to close his office and discontinue practice. At the present time about seventy-five cases are under investigation, where prosecution may be started, and four cases are pending in the circuit court. If it is considered desirable to eliminate illegal practitioners of medicine, as is true in every state, this Oregon method is worthy of study, where the recognition and prosecution of such cases thus progress automatically with a minimum of publicity as regards the informant and the individuals who are to be thus legally regulated.

THE CARBON MONOXIDE PERIL

The universal use of the automobile has been the most potent factor in disseminating the danger from carbon monoxide poisoning. It is almost a daily occurrence to learn from the newspapers of deaths of individuals from this cause. Although warning is continually proclaimed as to the danger of running the motor in a closed garage, accidental fatalities continue to be reported. Also this mode of exit is becoming more commonly popular for suicide. Knowledge as to this rapid and painless method of self-destruction seems to have attained wide publicity.

The Department of Commerce at Washington has recently published a bulletin, calling attention to the one-reel film, "Carbon Monoxide, the Unseen Danger," which has been prepared by the Bureau of Mines. During the past eighteen months, it is stated, this film has been shown before audiences of more than half a million of people. It visualizes the hazards of this deadly gas, illustrating its presence in automobile exhausts and city gas. The vivid scenes presented in this reel relative to "the universal poison gas" make a more lasting impression on the mind than could be possible from merely reading articles on the subject. This carbon monoxide film has been shown before many Government departments and is available for use before general audiences. It can be obtained without expense, except for transportation costs, by addressing the Pittsburgh Experiment Station of the United States Bureau of Mines, Pittsburgh, Pa.

MEDICAL NOTES

OREGON

Change of Meeting Date. The date of the annual Oregon State Medical Society meeting at Eugene has been changed from September 10-12 to October 22-24.

Portland Academy of Medicine held its regular meeting May 27, when it was addressed by Dr. Harris Peyton Mosher, president of the American Board of Otolaryngology, also professor of laryngology at Harvard Medical School. The subject of his address was "The Present Status of the Major Diseases of the Esophagus."

Hospital Ban Discussed. An ordinance has been proposed in the Portland city council to permit the presence of a tuberculosis hospital within the city limits. It was declared that Portland is the only large city in the country where such legislation is not effective.

Contract Awarded for Hospital Construction. The state board of control has awarded the contract for construction of the new wing at the Eastern Oregon State hospital at Pendleton. The contract price is $125,800. With other improvements a sum of $180,000 is to be expended on the development of the hospital.

Jackson County Medical Society held its meeting Wednesday, May 6. The chief paper of the meeting was read by Dr. G. W. Gregg of Ashland on the subject of "Crataegus in Heart Affections."

Pathologist for Klamath Falls. Dr. A. W. R. Thiel, for five years pathologist at St. Elizabeth's hospital, Yakima, has recently located at Klamath Falls. He is a graduate of the University of Utrecht, Netherlands.

Dr. Ralph Fenton of Portland, sailed for Europe April 29, where he will attend the International Congress of Military Medicine.

Dr. Milton V. Walker of Coquille has recently moved to Springfield, where he will be associated in the practice of medicine with Dr. Eugene Kester.

Dr. T. E. Griffith has resigned as city health officer at The Dalles. His activities with the Oregon State Medical Society necessitated his resignation. He is succeeded as health officer by Dr. W. R. Taylor.

Dr. Robert C. Coffey of Portland traveled by airplane to Ashland May 12 in time to attend the annual meeting of Southern Oregon Medical Association, after completing his usual morning surgical operations at his hospital.

Dr. Thomas E. Griffiths of The Dalles, president of Oregon State Medical Society, gave an address at the annual meeting of Southern Oregon Medical Association at Ashland May 12, when he discussed the State Industrial Accident Commission, insurance, legislation, Oregon Public Health League and Woman's Auxiliary to the state and county societies.

Dr. Squire Bozorth, formerly of Oregon City, who has spent the past year at New Orleans Eye, Ear, Nose and Throat hospital, has located in Portland, where he will serve as resident in otolaryngology at Multnomah and Doernbecker hospitals.

WASHINGTON

Public Health Association Meeting. The Western Branch of the American Public Health Association held its second annual convention in Seattle May 28-30. Delegates were in attendance from the eleven western states, British Columbia and Hawaii. Dr. William C. Hassler of San Francisco, president of the Western Branch, presided. Subjects discussed included health education, mental hygiene, modern municipal drinking water safeguards and the protection of milk and foods.

Ambulance Service Contracted. The King County commissioners have made arrangements with the Shepard Ambulance Company of Seattle to handle all county ambulance service for the next two years at a flat fee of seven hundred dollars per month.

Bids Called for Medical Service. The Board of Police Pension Fund Commissioners of Tacoma will receive bids for medical and surgical service to be rendered members of the police department for the coming year.

DOCTOR ON LEAVE OF ABSENCE. Dr. R. E. McPhail of the Mountain View Sanatorium, Tacoma, was granted a leave of absence by the board of county commissioners and has left for Saranac Lake, New York, to take a special course in tuberculosis and chest surgery.

COUNTY HEALTH OFFICER REAPPOINTED. Dr. C. L. Dixon, present county health officer of King County, has been reappointed to that post for another two year term.

STAFF OFFICERS ELECTED. The following officers were elected at the staff meeting of the Sacred Heart Hospital, Spokane. S. S. Oppenheimer, president; H. E. Rhodehamel, vice-presidennt; E. P. Condon, secretary-treasurer.

PIERCE COUNTY MEDICAL SOCIETY held a meeting at Tacoma, May 12, at which the following officers were elected for the ensuing year: President, Ralph Schaeffer; vice-president, F. L. Scheyer; secretary-treasurer, W. B. Penny; trustees, E. A. Rich, E. W. Jones, H. G. Willard, S. M. McLean and H. F. Arzne; delegates to annual meeting of State Medical Association, W. D. Reed and W. B. Penny.

LEWIS COUNTY TUBERCULOSIS LEAGUE held its annual meeting in Chehalis Saturday, May 9. The principal address was given by Dr. John F. Steele of Tacoma on the subject, "Childhood Tuberculosis."

HOSPITAL STAFF OFFICERS NAMED. Providence hospital in Seattle announces the following executive staff for the coming year: Dr. George C. Miller, president; Alexander H. Peacock, vice-president; Raymond Zech, secretary.

DR. L. P. MURPHY of North Bend took a postgraduate course in abdominal surgery at the New York Polyclinic School and Hospital. He has recently returned and resumed practice.

IDAHO

DR. HAYDEN HANCHER of Pocatello has located at Weiser. He is a graduate of Northwestern University School of Medicine of Chicago and has done postgraduate work in obstetrics and gynecology at the Chicago Lying-in hospital under Dr. Joseph B. De Lee.

DR. H. C. IRWIN of Pocatello announces the closing of his offices in that city.

NEW MEDICAL CENTER. Drs. A. R. Cutler, Eugene Worley, Orvid Cutler and S. S. Evans have recently opened a new medical center at Preston.

OBITUARIES

DR. JOHN FRANKLIN GART, aged 44, died at the Naval hospital in San Diego, Calif., April 17, of cancer. He was a graduate of the Southern California School of Medicine at Los Angeles. He had attained the rank of Surgeon, Lieutenant-Commander, attached to the Surgeon General's office. He was well known locally through his service during two tours of duty at the Navy hospital at Bremerton, Wash.

DR. JOHN WALTER WILKINS of Seattle, Wash., aged 61, died at St. Luke's hospital Tuesday, April 28, after an illness of several months. He was born at Mount Pleasant, Pa. He graduated from the Medico-Chirurgical College of Philadelphia in 1896 and was later a member of the faculty of that institution. He practiced for a time in Philadelphia and went to Alaska in 1906. For three years he practiced at Nome before moving to Seattle. He has resided in that city for the past twenty-five years. For the past ten years he has acted as manager of St. Luke's hospital, of which he was the founder.

DR. J. SHELLEY SAURMAN, aged 46, of Salem, Ore., died Saturday, May 16, at the University Hospital at San Francisco, Calif. The cause of death was heart disease from which he had suffered several months. He was a graduate of Temple University, Philadelphia, and held diplomas from both Army and Navy medical schools at Washington, D. C. During the World War he served overseas with U. S. naval forces with rank of lieutenant. He located in Salem in 1920 after practicing for a time at Burns. For the past six years he was in partnership with Dr. Laban A. Steeves.

DR. FREDERICK P. SCHULTZ of Portland, Ore., died at his home Thursday, April 30, aged 52 years. He received his medical training at Jefferson Medical College, Philadelphia. The cause of death was ascribed to a cerebral accident resulting from an increased blood pressure, from which he was suffering.

REPORTS OF SOCIETY MEETINGS

OREGON

SOUTHERN OREGON MEDICAL ASSOCIATION

Pres., D. M. Brower; Secty., E. A. Woods

Southern Oregon Medical Association held its annual meeting at Ashland May 12. This was one of the best attended and most successful gatherings in the forty years history of the organization.

The following program was presented:

President's Address, D. M. Brower.

"Treatment of Surgical Defects of the Oral Cavity," J. A. Pettit, Portland. Discussion opened by B. G. Barkwill, Ashland.

"Pulmonary Abscess, Nontuberculous," with lantern slides. E. A. Pierce, Portland. Discussion opened by C. L. Ogle, Grants Pass.

Address, Thomas E. Griffith, The Dalles, President, State Medical Society.

Address, Mr. Arthur Lawrence, Salem, member State Industrial Accident Commission.

"The Psychology of Appearances," with lantern slides. A. G. Bettman, Portland. Discussion opened by F. C. Adams, Klamath Falls.

"A Practical Consideration of Surgical Dyspepsia," with lantern slides. W. H. Bueermann, Portland. Discussion opened by G. E. Houck, Roseburg.

"Trifacial Neuralgia, Including Involvement of the Sphenopalatine Ganglion, Myositis, Herpes Zoster and Other Conditions," with lantern slides. J. E. Else, Portland. Discussion opened by E. A. Wood, Ashland.

"Some Medical Uses of Diathermy, with Reference to Hyperpyrexia." A. C. Jones, Portland. Discussion opened by C. T. Sweeney, Medford.

Address, Frederick Stricker, secretary of State Board of Health, Portland.

The following officers were elected for the ensuing year: President, B. R. Shoemaker, Roseburg; Vice-President, B. G. Bailey, Grants Pass; Secretary-Treasurer, E. A. Woods, Ashland. Board of Censors: C. L. Ogle, Grants

Pass, to serve three years; Robert Syearns, Medford, to serve two years, filling the place vacated by Dr. Clancy, Medford. Delegates to State Medical Society: D. M. Brower, Ashland; alternate delegate, F. G. Swedenburg, Ashland.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of the King County Medical Society was held May 4, in the Medical-Dental Building, Seattle, with Dr. R. J. McCurdy in the chair. Approximately 155 members were present. Minutes of the meeting of April 6 were read and approved.

Dr. Marr Bisaillon of University of Oregon Medical School, delivered an illustrated address on, "Differential Diagnosis of Malignancies of the Lungs." A study of sixteen cases of primary bronchogenic carcinoma were presented with correlation of pathologic and clinical findings. The initial site of this condition may be found in any part of the bronchial lining or the submucous glands but is most common in the primary and secondary bronchi. The symptomatology, physical signs and roentgenologic findings can all be explained on the basis of pathologic changes. There seems to be a definite increase in the incidence of primary bronchogenic carcinoma. Differential diagnosis between this condition, pulmonary tuberculosis and other lung conditions was considered in detail. The paper was discussed by Drs. Slyfield, Castlen, Waltz and Watts.

Dr. L. D. Fricks, of United States Public Health Service, presented a paper on "Rocky Mountain Spotted Fever." Until recently is was believed that this disease was confined to definite endemic areas, located in nine Rocky Mountain states. During the summer of 1930, ninety-three cases were found in eastern mountainous regions from Delaware to North Carolina. On account of its wide distribution, every well informed physician should familiarize himself with its clinical appearance. Its close relationship to typhus fever was emphasized, its method of distribution by ticks was described as well as the peculiarities of its eruption. The incubation period is from four to seven days. The mortality in Southeastern Montana approaches 90 per cent, approximating 5 per cent in Southern Idaho, while cases studied in eastern states give a 23 per cent rate. A protective vaccine has been prepared by the Public Health Service which has met with considerable success, more than fifteen persons having been vaccinated with it during the past five years. The paper was discussed by C. A. Smith and E. E. Maxey of Aberdeen who, in 1899 while living in Boise, Idaho, published the first complete clinical account of this fever.

Drs. W. H. Brandt and W. B. McKibben were elected to membership. Aplications were presented from Drs. G. W. Freeman and P. S. Shigaya.

The medical section of the Society held its regular meeting May 11, with Dr. D. H. Nickson in the chair.

Dr. C. J. Rohwer read a paper on, "Cerebral Vascular Syndromes." Two cases were described. The first was a man, whose symptoms were detailed, with a diagnosis of thalamic syndrome. Slides were presented illustrating the neuroanatomy involved. The second patient was a man who was afflicted with mental symptoms while on the golf course. Symptoms were detailed which warranted the diagnosis of a thrombosis of the left posterior inferior cerebral artery. Both patients made successful recoveries. The paper was discussed by Dr. G. E. Price.

Dr. Lester J. Palmer presented a paper, "Is Insulin Reducing Diabetic Mortality? Conclusions of Diabetic Deaths in Washington During 1929." In spite of the increase in the number of total deaths, that from diabetes was lowered. Apparently insulin enabled patients to live longer. Statistics show that diabetics who might have died in 1923 and 1925 lived a period of several years longer. Two of every three diabetics dying in 1929 used insulin during some period of the disease. The necessity was stressed of the need of early diagnosis. The subject of diet was discussed, with suggestions regarding this subject. Deaths from diabetic coma will disappear when the public view the matter as seriously as they do appendicitis. Failure attributed to insulin lies not in this drug but the inaccurate use of it. The paper was discussed by Dr. C. E. Watts.

Dr. E. A. Rawson reported trichinosis occurring in five members of a family and their dog. Infection was traced to cooked pork that had passed official inspection.

LEWIS COUNTY MEDICAL SOCIETY

Pres., H. B. Cravens; Secty., Rush Banks

The regular monthly meeting of Lewis County Medical Society was held at Centralia, May 11. Dr. E. O. Houda of Tacoma addressed the society on the subject of "Goiter." He exhibited a large collection of goitrigenous bacteria and presented a complete exposition of items directly correlated with the disease, particularly showing the utter impossibility of a partial vacuum of inorganic elements as having anything in common with the cause of this or any other disease. He maintains that endemic goiter is a distinct pathologic entity and like every etiologically determined disease, has its distinct common denominators. Organisms are now constantly demonstrable in its tissues and the serum readily obtained from them on surgical removal. With a described proper method it is cultured from all of them with monotonous regularity.

Continentals, whom Dr. Houda interested during his trip to Europe last summer, he claims have now confirmed his bacteriologic findings unqualifiedly, the French now applying a vaccine prepared of goitrigenous bacteria in the treatment of goiter in children and postoperatively in old goiters. The classic results now obtained by this vaccine in the treatment of the clinical varieties of the disease, without the enhancing value of therapeutic iodine, leaves little more to be desired. Old goiter, composed of irreversibly fixed pathologic tissues, is surgically founded upon past empiricism, but now established upon the same basis as that of other pathologic tissues requiring removal.

Recurrences, all too common, are due to cause of first instance in residual infection. Complete cure calls for biologic immunization, best realized by postoperative autogenous vaccines. Preliminary immunization before surgical interference has Lugol solution bested, in too classical a manner to leave serious doubts. The array of investigators, who entertain an infection hypothesis for this disease, cannot be duplicated under other hypotheses. Endemic goiter is the ultimate result of a specific thyroiditis.

Dr. William H. Goering gave an illustrated talk on "The Modern Mode of Attack on Arthritis."

Dr. Rush Banks was elected delegate and Dr. H. L. Petit alternate to the State Association meeting at Aberdeen.

This was the last regular meeting of Lewis county medical society until fall.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Secty., G. C. Daniels

The regular monthly meeting of Walla Walla Valley Medical Society was held at Walla Walla, May 14.

Dr. E. E. Anderson of Aberdeen, president of Washington State Medical Association, gave an outline of plans for the annual state meeting which will be held in Aberdeen, Aug. 3-5.

Dr. C. E. Watts of Seattle gave an address on, "Clinical Significance of X-ray Findings in Cardiac Diseases."

Dr. Oscar Proctor of Seattle discussed "Surgery of the Chest."

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Recent Advances in Hematology. By A. Piney, M.D., Ch.B., M.R.C.P., Hemotologist, Cancer Hospital, London, etc. Third Edition. With 4 Colored Plates and 18 Text Figures. Cloth. 348 pp. $2.50. P. Blakiston's Son and Co., Inc. Philadelphia, 1931.

The author begins with a review of recent knowledge about the reticuloendothelial system and notes the change of view in respect to bile formation, showing that the cells of this system outside of the liver are capable of transforming hemoglobin into bile, as has also been demonstrated in this country by Mann and his coworkers. In considering the leukemias the erroneous idea of their being blood diseases is pointed out, the changes in the blood being secondary to hyperplasia of the blood-making organs, and quality or immaturity rather than quantity of white cells is the essential feature. Thus the fallacy of aleukemic leukemia, as if it were a distinct entity.

The regular occurrence of anemia with leukemia, as well as in infections, is explained on the ground that the reticuloendothelium cannot at one and the same time produce a normal number of red cells and excess of leucocytes. In fact, in some cases of leukemia not only is there no leucocytosis but at times no qualitative abnormality in the distribution of leucocytes. These are the puzzling cases in practice we have all encountered that may only be solved by puncture of the spleen or autopsy, as pathologic changes are always found in the hematopoietic organs.

The author emphasizes again and again that the number of circulating leucocytes is not the important diagnostic feature of leukemias but the presence of immature cells. In the chronic form of myelosis or myeloid type of leukemia, the nongranular myeloblasts are the most important cells, gradually increasing until death occurs when they predominate. Lymphatic leukemia tends to become aleukemic at times, as well as the myeloid form. If first seen in the aleukemic phase, diagnosis becomes impossible, as we have unfortunately discovered, there being only anemia and perhaps irregular fever upon which to base an opinion, even lymphocytosis being absent.

A change from the leukemic into the myeloid type, or vice versa, is reported by some observers. Piney denies this occurrence, attributing the error to failure in properly discriminating the myeloblast from the lymphoblast. In practice the reviewer has experienced a diagnosis of one type of leukemia, made after most careful study by one of the leading hemotologists in the country, only to be reversed at autopsy by examination of the hematopoietic organs. Such happenings prove the diagnostic difficulties even in the hands of the elect.

The author postulates that leukemias are neoplastic in nature, the blood picture being caused by the emigration of white cells from the tumor focus in the bone marrow, together with immature cells derived from neighboring hyperplastic hematopoietic tissue. He employs an improved nomenclature in reference to the leukemias which we have purposely avoided for simplicity's sake.

Regarding pernicious anemia, it is shown that tapeworm anemia and the pernicious form are identical; the former may be even cured without getting rid of the parasites. Only a small percentage of persons infested with tapeworm develop pernicious anemia, as these are probably predisposed constitutionally to the disease. This predisposition is noted in those with hereditary achylia. According to Piney pernicious anemia only occurs in individuals having a particular type of hematopoietic system, especially in those possessing a remnant of megaloblastic tissue in their livers, the chief blood picture being a varying degree of megalocytosis. Anemia is not in itself an essential symptom of pernicious anemia and indeed may be absent over long periods of time.

This is an exceedingly interesting and valuable little book and we have barely touched upon a fraction of its high points. No internist can afford to neglect it.

Winslow.

The Diagnosis and Treatment of Brain Tumors. By Ernest Sachs, A.B., M.D., Professor of Clinical Neurological Surgery, Washington University School of Medicine, Saint Louis. Two Hundred Twenty-four Illustrations, Including Ten in Colors. 396 pp. $10.00. The C. V. Mosby Co., St. Louis, 1931.

This new volume is one of the first publications to deal with brain tumors from the standpoint of the neurosurgeon. It is prepared specially for the general practitioner and surgeon who might have occasion to meet in his practice with brain tumors. As the author states, anyone may run across a case of brain tumor in ordinary practice. Brain tumors are relatively common, and since the diagnosis has been made more easy and more accurate in recent years, and with the advent of the electrosurgical unit for their removal, the author believes that more attention should be paid to the early diagnosis and the patient given an opportunity for at least a large percentage of cures. With that in mind, he has prepared this book.

He has devoted the first chapter to the surgical anatomy and physiology, the second to the examination and the typical outline for the various methods of making the examination. The third chapter discusses the surgical pathology of brain tumors, the fourth, fifth, sixth and seventh being devoted to the pathology and the special localizing signs in brain tumors. In chapter eight he considers the differential diagnosis between brain tumors and other conditions which might simulate a tumor. The last chapter is devoted to operative technic and postoperative treatment.

This book offers a ready reference, and most of the subjects are brought up to date from the current literature. For the general physician and surgeon it is a ready guide to an early diagnosis in these cases. It is nicely written and the author has made use of his experience, reciting typical case histories wherever it seemed necessary to emphasize a point, either in diagnosis or in treatment. It is beautifully illustrated, colored as well as plain drawings have been used liberally. The author has made use of encephalograms and ventriculograms in the localizing of tumors. This newer method of technic, he apparently believes, is the last word in the final diagnosis.

The chapter on microscopic diagnosis of tumors is based on the work of Cushing, Bailey and Penfield, and gives a very good outline for pathologists to follow. The book should be well received by the profession. SWIFT.

THE RENAL LESION IN BRIGHT'S DISEASE. By Thomas Addis, Professor of Medicine, Stanford University, and Jean Oliver, Professor of Pathology, Long Island College of Medicine, etc. With 170 full page plates, 2 in color, 21 text illustrations and 1 folding table. 628 pp. $16.00. Paul B. Hoeber, Inc., New York. 1931.

Addis observed and demonstrated that previously used methods of urinalysis gave no index of the type of severity of Bright's disease. Therefore he developed new methods which he found to give remarkably accurate information, not otherwise obtainable. His method of collecting the sample is designed to preserve the acidity and the concentration of the urine, thereby preventing destruction of the formed elements, especially casts and red blood cells. Studies on normal medical students showed that urine from these healthy individuals contained casts, red cells and various other formed elements, as well as protein, and the diagnosis of Bright's disease, therefore, became a quantitative one, rather than qualitative. He determined the upper limits of normality as regards total excretion of casts, protein, red cells, and white and epithelial cells, per twelve hour period. The quantitative characteristics of the urinary sediment in various forms of Bright's disease were then studied, with illuminating results.

Patients who were studied clinically by Addis, and finally yielded autopsy material for study by Oliver, seventy-two in number, form the basis of this monograph. The conclusions in each case were arrived at independently, and their close correlation proves the value of the methods, as well as the meticulous care of the authors.

The classification of Bright's disease has always been badly confused, and previous attempts at anatomic classification have only led to greater clinical confusion. The authors have shown that morbid anatomy and the clinical and laboratory findings have a closely demonstrable relation, thereby leading to a more sound classification and a better understanding of the various forms of the disease. Their broad classification into (1) hemorrhagic Bright's disease, (2) degenerative Bright's disease, and (3) arteriosclerotic Bright's disease, seems to be on a sound basis.

The laboratory methods employed seem to be laborious, and too time-consuming for clinical work, but it is contended that the work is relatively simple after a little training, and the extra work is worth while and necessary, if one is to have more than a superficial knowledge of his patient. The pathologic section of the book is beautifully illustrated and is written in a style which is anything but dry. The discussion of the nature and pathogenesis of Bright's disease gives one an excellent viewpoint for clinical insight in a common malady which is not yet well understood. This monograph is a notable contribution, the illustrations being numerous and beautiful, and deserves to be widely read. WATTS.

SURGERY. Its Principles and Practice. For Students and Practitioners. By Astley Paston Cooper Ashhurst, A.B., M.D., F.A.C.S., Professor of Clinical Surgery in the University of Pennsylvania, etc. Fourth Edition, Thoroughly Revised. With 15 Colored Plates and 1063 Illustrations in the Text, Mostly Original. 1189 pp. $10.00. Lea & Febiger, Philadelphia, 1931.

This text-book has been completely revised. It touches on every phase of surgery and surgical diagnosis. It has been brought completely up to date, and includes rectal and spinal anesthesia, the injection treatment of varicose veins, tumors of the sympathetic nervous system and other items of recent surgical progress. There is a considerable amount of space devoted to fractures, and also to orthopedic surgery. There is no subject about which something is not said, although in most instances only essential points can be touched on. Being a text-book the author makes every effort for comprehensiveness, even though the subjects be treated in a superficial way. For ready reference the single volume surgery meets with popular approval. Hence the surgeon will obtain satisfaction from this book.

PROCTOR.

THE SEX FACTOR IN MARRIAGE. A Book for Those who are or are to be Married. By Helena Wright, M.B., B.S. With Introductions by A. Herbert Gray, M.A., D.D., and Abel Gregg, A.B., M.A. 122 pp. $2.00. The Vanguard Press, New York, 1931.

Previous to recent years the discussion of sex relations was generally tabooed, since prevailing prudery would not permit a free consideration of such matters. In contrast, at the present time it is apparently permissible to introduce such subjects with perfect freedom. The author of this little volume, an English physician, believes that much discord and lack of harmony among newlyweds is due to ignorance on the part of bride and groom relating to sexual contacts. In plain and simple language she considers various aspects of coitus and presents the knowledge which husband and wife ought to possess. There is nothing salacious or indecent in this discussion. Various normal aspects of sexual matters are considered in a manner that is both instructive and revealing. The author states that happiness in the marriage relation depends in the largest degree upon the establishment of correct sexual habits. The purpose of her book is to promote this happiness so far as can be attained by stressing a knowledge of these matters. This book can be commended to those contemplating matrimony as well as those newly married.

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Heart Disease. By Paul Dudley White, M. D., Instructor in Medicine, Harvard Medical School, etc. 931 pp. $12.00. The Macmillan Company, New York, 1931.

In the first sentence, of the preface, the author states, "The need of a clear concise and comprehensive presentation of the diagnosis and treatment of heart disease in the light of our present knowledge has caused me to write this book." In the reviewer's opinion he has admirably accomplished his aim, and has given the medical profession the best arranged and most complete book on heart disease that has appeared up to date.

The language is not too technical for students and practitioners; the details on anatomy, physiology, pathology, pharmacology and instrumental technic, as well as theories and mooted questions, are avoided and those who desire further information are referred to the authors mentioned in the enormous bibliography of one hundred and eighty-eight pages. This is arranged alphabetically, according to chapters, and placed in the last pages of the book instead of being scattered throughout the text.

Part I is devoted to history taking, symptoms and signs, and methods of cardiovascular examination, Part II to incidence, causes and types of heart disease, Part III to structural cardiovascular abnormalities, and Part IV to disorders of cardiovascular function. Knowing the author's wide experience, supplemented by the references given, one feels sure the information presented is authoritative and may be depended upon. von Phul.

Chemistry for Nurses. Including Certain Essential Principles from Inorganic, Organic and Biochemistry. A Combined Text and Laboratory Manual. By Harry C. Biddle, A.M., Instructor in Chemistry, School of Nursing, Western Reserve University, etc. With seventy-four illustrations. 336 pp. $2.75. F. A. Davis Company, Philadelphia, 1931.

The author states that chemistry has perhaps contributed more to human comfort and happiness than any other science. Nurses must have sufficient knowledge not only to understand but also to explain the principles involved in energy changes, digestion and other physical processes. This volume presents the essential facts of chemistry which are necessary to impart this information. Each chapter opens with questions answered in preceding chapters. Important facts relative to the subject under consideration are presented in simple language without the technicalities of the more extensive works on chemistry. In addition to the chapters dealing with organic and inorganic chemistry, the appendix presents essential chemical facts relating to topics that the nurse may pursue in other courses. If the nurse masters the teachings of this volume she will possess a useful fund of chemical knowledge.

A Handbook on Diseases of Children. Including Dietetics and the Common Fevers. By Bruce Williamson, M.D., Edin., M.R.C.P., Lond. Physician to the Royal Northern Hospital, London, etc. 290 pp. $3.50. William Wood & Co., New York, 1931.

This handbook is written to fill a need existing in students of the undergraduate course who must have a short, but complete, account of the diseases of children. If the perusal of its pages does nothing else, it will awaken the reader to the fact that the number of diseases children are heir to is legion, and that the pediatrician has an unlimited field of endeavor. All diseases, common and rare, are briefly discussed; and where needed, references are given to special textbooks and monographs.

The presentation of the disorders of the heart will strike the reader as new, causing him to pause and reflect upon the inadequacy of many of the older conceptions of the subject. One will see in this chapter a reflection of Mackenzie. Although handbooks usually occupy a mediocre place among complete classifications and the lengthy treatises found in our excellent sets of medical works, this book is well worth a few evenings. It will give a birdseye view of a most fascinating part of the practice of medicine, the specialty of pediatrics. Wade.

Fundamentals of Dermatology. By Alfred Schalek, M.D., Professor of Dermatology and Syphilology, University of Nebraska College of Medicine, etc. Second Edition, Thoroughly Revised. Illustrated with Fifty-eight Engravings. 247 pp. $3.00. Lea & Febiger, Philadelphia, 1931.

This is a convenient and handy epitome of dermatology, useful for ready reference in diagnosis and treatment. For convenience diseases are listed alphabetically. Each presents briefly symptoms, pathology, etiology, diagnosis, prognosis and treatment. Illustrations illuminate the text. There is a chapter on "Dermatological Aphorisms" which if memorized would be of great assistance to every physician treating diseases of the skin. One seeking a condensed description of conditions in ordinary practice will find it in this volume.

Surgical Clinics of North America. (Issued serially, one number every other month.) Volume XI, number 2. (Lahey Clinic Number—April, 1931.) 248 pages with 88 illustrations. Per clinic year (February 1931 to December 1931), Paper, $12.00; Cloth, $16.00. W. B. Saunders Co., Philadelphia and London, 1931.

The extent of the Lahey Clinic is suggested by the fact that reports are presented in this volume from fifteen men connected with that organization. They cover a large variety of surgical conditions and operations. Lahey discusses treatment of carcinoma of the colon with special reference of the Mikulicz procedure, with demonstrations of its efficiency in affections of all parts of the colon except the transverse. Vestal presents an instructive review discussing what conditions are benefited by splenectomy. This operation has quite definite indications and contra-indications and should be performed only after a thorough study of each individual case. The prevention of parathyroid tetany is explained by Cattell. Wide exposure with visualization of the parathyroid areas is essential and the transplantation of removed parathyroids at time of operation will aid to reduce the incidence of tetany. Many useful and instructive discussions are presented concerning many surgical conditions.

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THE MANAGEMENT OF DIFFICULT LABOR *

G. Heusinkveld, M.D.
DENVER, COLO.

Natural labor as defined by Herman is a case in which "the mother is in good health, the pelvis is of not less than normal size; when the child is living and of not more than normal size; when the vertex presents and the child's back is in front; when the membranes do not rupture until the os is at least three-fourths of its full size; when the placenta is implanted above the lower segment of the uterus and is not detached until the child is born; when the uterine contraction and retraction go on at such a rate that the child is born within twenty-four hours from the beginning of labor pains and continue after the child is born." This is considered by an English obstetrician as a minimum standard for what we are accustomed to call a natural, physiologic process. Obviously the attendant must determine when his cases meet these requirements.

It is my belief that it is our duty to determine as early as possible whether a case will be normal or not. We must begin with the study of the patient from the time she first comes to us, taking a careful history of previous pregnancies, if any, of childhood diseases, a history of the usual functions of womanhood, of the pregnancy to date; in short, a detailed record of the patient up to the time she places herself in our hands and the responsibility upon our shoulders. The physical examination should include not only the usual examination of chest and its contents, of the abdominal contents, but also, and especially in primiparous women and in women with a history of difficult labors, a detailed examination of the pelvis, both its bony structures and viscera.

Pelvimetry is one of the most useful procedures at hand in estimating the obstetric possibilities of our patient. During our student days we all learned the formula: crests twenty-seven, spines twenty-five, trochanters thirty-two, Baudelocque twenty-one, and anything that was not less than these dimensions was to be considered normal. The importance of the proportions of these diameters to one another is, I feel, not emphasized enough in the textbooks. For instance, the measurements just given would suggest the average American woman's pelvic measurements, but suppose we have a case in which the Baudelocque is twenty-one, crests twenty-nine, trochanters thirty-five. At once you see the lack of symmetry due to the short Baudelocque. The result is that the pelvis is almost sure to be more or less flat and in a few cases this type engages the head with the sagittal suture in the transverse diameter and causes delay.

Again, take this case; crests twenty-nine, spines twenty-seven, Baudelocque twenty-one, trochanters thirty-two. Very likely when you check this pelvis, you will find, as I did in this case, that you are

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* Read before the Thirty-eighth Annual Meeting of Idaho State Medical Association, Coeur d'Alene, Ida., June 27-28, 1930.

dealing with a funnel pelvis. Still in both instances the measurements were all not less than the given minimum standard. I think the examination of the proportions in this way is essential in the conduct of our maternity cases.

The internal conjugate is a measurement of great importance, although in cases where it is most needed it is most difficult to obtain because the small patient is often nervous, and she finds it difficult to relax for the proper depression of the pelvic floor to enable the examining finger to approach the promontory of the sacrum. However, the attempt should be made and at the same time the width of the pubic arch should be noted. Also, this is very important, the degree of concavity of the sacrum. Many a difficult labor can be foreseen, if the latter point is noted.

Outlet pelvimetry is coming to the fore in many clinics. In borderline cases I think the procedure is valuable. Williams gives the lowest dimensions of the outlet of the pelvis as eleven centimeters between the tuberosities of the ischium and nine for the anteroposterior diameter. A practical way of determining the obstetric possibilities of the pelvic outlet might be suggested thus: Measure the distance between the thumb nails that would be level with a line drawn between the tuberosities of the ischium at the level of the anus; then measure posteriorly from the central point of this line to the tip of the sacrum, taking care to disregard the coccyx. The sum of these measurements should in any case be not less than fifteen centimeters. Thus, if the biischial diameter is nine, the posterior sagittal, as this diameter is called, should be six; if the biischial diameter is eleven the posterior sagittal diameter need be only four. These measurements do not consider the anterior sagittal diameter. This is difficult to get and, if the pelvis is not deformed, it will be found in position somewhere proportionate to the other two diameters and hence can be dismissed after simple palpation.

The sum total of information gained in this way is useful in determining the possibility of getting a head through the pelvic outlet. It should be done in all cases, where the external pelvimetry above described is in any way abnormal. For instance, the case described with the trochanters of thirty-two and the crests of twenty-nine had a biischial diameter of nine and one-half with a posterior sagittal of seven, completing the dimensions of the funnel pelvis. It should be done in all cases of breech presentation or when version and extraction are contemplated. These measurements may be done early in the pregnancy and information and conclusions drawn therefrom or can be left until the patient is in labor.

It must be mentioned that we are studying only one factor here, namely the size of the mother. The other factor, the size of the baby, must be considered in all cases but for want of space I shall mention it only in passing.

There is one very valuable asset coming into use in pelvic measurements, namely the stereoscopic roentgenogram. A stereoscopic plate at term or when the patient is in labor is a very valuable help in deciding the borderline case and the proportions of the pelvis can be measured with a surprising degree of accuracy by means of formulae from the data on the plate.

It is always wise to recheck our information and impressions of a case at the onset of labor. Here we have the final size, position and presentation of the child as it will meet us in the process of labor. All factors should be again considered and an estimate made in our own minds of how a patient will get along. I am considering only difficult cases in this paper, but we should have some idea of whether a case will be easy or difficult before a patient has been in labor very long. With these facts in mind, let us consider some of the major obstetric problems that confront us.

Uterine inertia is one of the commonest of our troubles. Under uterine inertia we consider two forms, primary and secondary. Primary uterine inertia is manifested by irregular or scattering pains, short, cramp-like, colicky pains or badly coordinated pains. The efforts of the uterus are apparently in a state of anarchy. The woman is restless, suffers a great deal, she cannot sleep, is nagged and feels that she is getting nowhere.

Secondary uterine inertia follows a long, severe labor and is simply a question of muscular exhaustion and one might say that the uterus temporarily goes to sleep.

The causes of primary uterine inertia are various. An overdistended uterus with its resulting thin musculature is one of the commonest; twins are often accompanied by uterine inertia; polyhydramnios is always a cause. It has been interesting to note that so-called infantile uteri when they become pregnant often begin labor with very indifferent pains. Adherent membranes, due to chronic endometritis or possible slight bleeding after conception, may so bind the uterine musculature that the internal os cannot relax and the coordinating factor is lost; a full bladder is sometimes the whole trouble; emotional upsets may also cause primary uterine inertia.

In cases of primary uterine inertia the treatment consists in examining the cervix to determine whether the membranes are loose and then such stimulation as may be necessary to bring about strong contractions. Quinine and castor oil are much used. Two minims of pituitary extract at frequent intervals, and the new preparation, thymophysin, are used in many clinics; occasionally these patients do well after a dose of morphine.

Secondary uterine inertia, as I have said before, is nothing but exhaustion and should be treated as such. Because of the danger of postpartum hemorrhage it is never safe to deliver immediately a true case of secondary uterine inertia. After a case has been in labor so long that the uterus has been exhausted, emptying the uterus will not stimulate it to contraction. It should be rested for a few hours and then delivery accomplished when the uterus resumes its activity. This rest can be obtained easiest by giving the patient a proper dose of morphine or of chloral.

It might be well here to study for a moment the process of the dilatation of the cervix. We all have been taught that the cervix is dilated by means of the "hydrostatic wedge of the bag of waters," or in case of its absence, by the dilating force of the presenting part. Any of us can recall cases in which the cervix dilated itself and there was neither bag of waters nor presenting part to aid the process. For instance, in a case in which the head fails to emerge and the forewaters are gone, the dilatation still completes itself. When there is a shoulder or similar abnormal presentation, the advancing part is either too small or too remote to aid in the dilatation in any way. Clearly there must be some other factor in the mechanism.

Let us consider this from the point of view of a smooth muscle, hollow organ emptying itself by its own peristaltic efforts. The cervix is a complicated anatomic structure; it consists of circular and longitudinal smooth muscle fibers; there are long fibers running down from the side of the body of the uterus that pass through a more or less fibrous ring at the internal os, where some diverge laterally, forming the various uterine ligaments, the most important of which are the so-called Mackenrodt's ligament which lies bilaterally in the bases of the broad ligaments, the uterosacral ligaments and smaller bundles which go to form the pelvic diaphragm. The rest of these fibers proceed downward, ending in the cervical tissue.

When a cervix dilates, therefore, there must be a coordination in which the circular fibers relax, a tightening of the fibers that come from the body of the uterus, pulling the cervix open equally from all sides and in all directions and at the same time pulling the tissues in the neighborhood of the internal os in all directions toward the bony pelvis. This is quite a different proposition from what we undertake when we lightly say, "I'll finish this with manual dilatation." I grant that this procedure is sometimes necessary, but let us understand that when we undertake it we are going counter to all physiologic processes, and conduct our procedures with due gentleness and caution. This should be done under complete anesthesia and at a very slow rate, certainly not greater than an inch in fifteen minutes. The cervix under this treatment is prone to tear and to our chagrin we find a little nick here and there in the cervix where we thought we had achieved a perfect dilatation.

The uterus, then, opens and empties itself by a sort of disgorging action which is characteristic in the peristaltic properties of all smooth muscle organs. The upper part of the uterus thickens and has a propellent action on the uterine contents; the lower part of the uterus, including the cervix thins and diverges from the axis in all directions until the canal is of the same caliber as the vagina. When this is accomplished, the expulsive efforts of the uterus, marked by the characteristic change in the pains, begin. In passing it might be noted that the violent efforts on the part of the patient to deliver herself or bearing down efforts are absolutely useless before that stage of parturition when the uterus itself starts this process. Before that, bearing down only pushes against the fundus of the uterus and, since the baby is inside the uterus, these forces are not conducted to the child at all. Also it has the very serious result of exhausting the patient.

It should be pointed out from the foregoing statement that the cervix is completely dilated only when the canal of the vagina, the cervix and the lower uterine segment are continuous. This is extremely important in the management of version, extraction and of breech cases and abnormal presentations of any sort. If there is an appreciable band of cervix left, the irritation caused by the child's passage will stimulate it to contraction and the relaxation, incident to the passage of the neck through the cervix, permits it to grasp the neck of the child with a vise-like grip that does not relax before the child is dead. The uterus can open itself by virtue of its own intrinsic muscular structure without the aid of accessory help from its contents.

Another problem that confronts us on occasion is slow cervical dilatation. The causes of this are several. Here, again, emotional strain, especially great fear on the part of the patient, plays an important part. It is due also to chronic inflammations of the cervical tissue, spasm, tumors or to agglutination of the membranes to the cervical tissue. This condition is prone to occur in premature labors, especially those occurring around the seventh or eighth month.

Before going on with the next topic let us refresh our minds on the use and the manipulation of the obstetric forceps. The type of forceps used by any man is immaterial. Let each operator thoroughly familiarize himself with one type of forceps, and with the proper understanding of the various positions of the head, its mechanism of delivery, especially internal rotation and extension, and he will do good work, provided he proceeds with the proper deliberation and gentleness. As Dr. Henry Swartz was heard to say, "It is not easy this way. Let us rest and calm ourselves and try another." I think that is the essence of successful obstetric work. Only the tyro thinks he must make his application in one trial. It is absolutely impossible to do this every time and it is well to make as many applications as necessary in difficult cases to assure the best possible adaptation of the child's head to the pelvis and the forceps blade. Caution, deliberation, and gentleness are the cardinal virtues of all obstetric procedures. Seldom is the emergency so great or the time so short that delivery must be rushed.

After the forceps are applied, the blades should fit snugly over the sides of the child's head and should both be in the same plane. Whether the handles come together naturally depends on the size of the child's head. It is never necessary to grip the handles of the obstetric forceps. Handling a pair of forceps like a pair of pliers is unnecessary and can result only in compression of the child's head and may be followed by disastrous results. If the blades are correctly made and correctly applied, the counter pressure of the maternal pelvis will in all circumstances keep them from slipping and the only efforts needed of the physician are traction and direction. Even if we feel the forceps slipping, we cannot help matters by gripping the handles. With the ordinary Simpson or Elliott forceps the axis traction principle may be readily accomplished by the Saxtorf maneuver. I think in the average physician's hands, who does not have cases enough to become expert with all the various special forceps for special conditions, it is better to become thoroughly familiar with a single type of forceps that he can use in the varying conditions.

In the traction on forceps we should all take a leaf from the book of Nature. There is very good reason for the alternation of contraction and relaxation. During the period of contraction the head is wedged into the pelvic canal with a resulting cerebral ischemia. Then comes a period of rest of a minute or so, during which the child's brain is again suffused with blood. We can nearly imitate this with our forceps traction and we should do so to prevent later softening of the brain. My own procedure consists in traction of about forty-five seconds to a minute; then the head is simply held in position for a similar length of time to obtain molding; then the forceps are released and unlocked for the period of a minute or so; then the whole procedure is repeated, ascertaining at the beginning of each pull that the sagittal suture is at right angles to the plane of the forceps. Traction must in all cases be steady. Any sawing or prying efforts are transmitted to the baby's skull and at the same time loosen the vaginal structures from their areolar tissue backing, and result in added trauma. The direction of the blades must in all cases be governed in their relation to the rectum and the bladder. It is very easy to pinch the urethra or the tender anterior structures or the rectum between the metal blades and the bony pelvis, causing widespread damage.

The persistent occipitoposterior position is one of the problems that confront us on occasion. In this instance the head is always partly extended, presenting a greater diameter to the pelvic outlet, thereby increasing the difficulty of delivery. This condition can usually be met by an application to the sides of the head wherever it may be, pushing it slightly upward so as to loosen it and then gently allowing the forceps to rotate the occiput to the posterior position. When the occiput is anterior, the forceps will be found with the handles pointing almost vertically downward. One blade is now disengaged from the side of the head, with great care in an outward direction so as not to pinch either mother or child. This blade is then reapplied to the opposite side of the child's head before the second blade is taken off. The second blade is then taken off in its turn and reapplied on the opposite side. The delivery is then completed as in low forceps. In most cases, internal rotation of the head can be easily accomplished manually. This will be found most satisfactory. When the woman is large or when the child is unusually small, delivery as a persistent occipitoposterior may be accomplished, but when child and mother are both about average size this may result in rather deep lacerations.

Occasionally we find a baby presenting with the occiput either to the right or to the left laterally, bringing the sagittal suture in the transverse diameter of the pelvis. The condition should be watched for an hour to see if rotation either anterior or posterior will not complete iself. If this does not occur, spontaneous extension of the head in the mechanism of delivery will be exceedingly difficult. The child doubles its head toward the anterior shoulder with one cheek riding on the promontory and the other jammed in the angle of the symphysis. This is probably the most difficult forceps application in the obstetric category. Generally speaking, maneuver the head into either an occipitoanterior or occipitoposterior and proceed as above. It is especially for this condition that the well known Kielland forceps have been invented but it seems to me that, unless one sees many of these cases, it will be easier to apply the anterior blade of the forceps to the posterior side of the baby's head and then slide the blade to the opposite side of the head gently with the hand in the pelvis. Under no circumstances should a forceps blade be inserted in the pelvis and forced into position from the handle. This may result in severe damage to mother or child. The posterior blade is then inserted and the delivery accomplished. The above condition is sometimes called occipitotransverse or deep transverse arrest.

Occasionally we find after a long labor with competent pains that the head has not entered the pelvis at all. It becomes a nice problem for the physician to determine whether there is disproportion, malpresentation, or whether the liquor amnii is floating the head above the brim. During the interval between pains one can frequently push the head into the pelvis and, if it sinks in at all, the membranes are ruptured and the delivery is uneventful. More often the difficulty is due to a flat pelvis or to an unusually high promontory, in which case the physician must determine his own procedure. The operation of high forceps is rapidly going into disuse, its place being taken by version and extraction if there is no disproportion, or cesarean section if there is disproportion. High forceps cannot be done without oblique application to the child's head and severe trauma to the maternal soft parts.

More common than the oblique vertex presentations are the breech presentations, such as full breech, frank breech, footling, knee, etc. Naturally this condition will be determined early in labor, if the patient calls the physician in any reasonable time. A minute estimate of the condition should be made; the pelvimetry should be rechecked, if necessary, to make sure that the proportions are right. In most cases a woman can successfully deliver a breech without any great danger to herself or her child. When assistance becomes imperative we have two lines of procedure; first, to deliver by means of extraction; second, by abdominal delivery. Needless to say the latter is only used when the proportions make the former impossible.

There is one cardinal point that must be observed in all cases where extraction is undertaken, namely, the complete dilatation of the cervix. Even with a part protruding, if the cervix is not dilated, we can only cause trouble by premature interference. When conditions are ripe the patient is completely anesthetized, the presenting part is pushed out of the pelvis slowly, both feet swept down, an episiotomy done in primiparous women and the body gradually brought to light. An assistant should keep the aftercoming head flexed from the time the breech appears, taking care that his hand is on the fetal head and not on the fundus uteri. The body is gradually brought down and the shoulders after being delivered are pushed back against the maternal parts. The external hand then gradually flexes the head into the pelvis and delivery is accomplished by flexion of the head on the sternum in any manner you prefer. Potter has shown how the anterior shoulder easily disengages itself from under the symphysis pubis, bringing the arms with it. The posterior shoulder may then be rotated anteriorly in its turn. Even when the arms are extended behind the occiput, gentle rotation will drag it into its normal position and, as it is not accompanied by pressure from above or traction on the part of the operator, the danger to the child is negligible. It is only when rotation is accompanied by traction that we are liable to damage either the child or the mother.

This is a time for the obstetrician to exercise the greatest self control. There is plenty of time to deliver any average case provided we do not hurry. If the head appears to come slowly and we start traction on the neck, we are bound to extend the head and get ourselves into greater difficulty, since the extension of the head increases the diameter of the aftercoming part. If the head will not enter the pelvis in the first diameter, press the shoulders against the symphysis pubis and present it in another diameter. If that does not work, try a third diameter or a fourth, but in no case allow yourself to make any appreciable traction on the child's shoulders. There is no objection in these cases to doing a generous episiotomy so that the child's head may not be delayed or injured by its passage over the perineal body.

The care of the child after a difficult labor sometimes needs special consideration. There can be no question that the head of a child exposed for hours against pelvic structures or a rigid perineum runs the risk of cerebral hemorrhage. Without a doubt many such cases have been laid to the application of forceps, when the condition really existed long before. It becomes a nice problem to decide when interference is justified; this must be determined in each case individually. I usually interfere, if there is no progress for an hour in the second stage with competent pains. When the child is born, if the mother is under anesthetic, it will likewise be anesthetized. Under such circumstances efforts to make the child cry are manifestly absurd. Make sure that the mouth and throat are clear of mucus, that the baby's heart is beating and then give the child time. Pelvic repairs can handily be done while waiting for the child to react. If the child is obviously in distress, one of the simplest means of resuscitation is mouth to mouth insufflation.

A simple and safe means of clearing the larynx of the child is as follows: pass a silkworm suture through the tip of the child's tongue, thereby making traction on it to keep the larynx open; a gauze square is then put over the child's mouth, taking care not to cover the nose and the attendant gently breathes into the mouth with the nose uncovered as a safety valve. Probably it is best to use the last part of one's exhalation for insufflation as that contains more carbon dioxide which in itself is an excellent respiratory stimulant. These measures may be very well carried out when the child is held in a tub of water with the temperature of 105-110 degrees. Violent measures of artificial respiration or cold dips do no good and may do harm, especially in the case of pallid asphyxia. The administration of about fifteen cc. of whole adult blood intramuscularly in the child is a good precaution against cerebral hemorrhage. It can do no harm and may save an extensive hemorrhage that unchecked would go on for several hours before its pernicious work becomes apparent.

In closing, I would like to emphasize that the procedures above outlined are considered only after due time has been allowed for conditions to right themselves. The consideration of normal cases and the time for interference is beyond our scope. Only with conscientious study of each individual case is it possible to keep our diagnostic ability sharply developed. It is of no particular credit to anyone's obstetric ability to observe after a long labor that a child is not born, but it takes mental labor in these difficult cases to find why it is not born.

The study of normal cases, which constitute the majority in your practice and mine, will sharpen our wits and fit us for the task of dealing with abnormalities when they arise. Surely we cannot recognize an abnormal condition unless the normal is thoroughly impressed upon our minds. Abnormalities become apparent early to the alert mind and the well-informed attendant promptly decides the proper move in the case. Conservatism is not procrastination. Each case is to be handled on its own merits, and abnormalities are as individual as the leaves on the trees. The man with ingenuity and resource is eminently fitted for one of the most responsible tasks society lays upon the shoulders of its physicians.

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FRIEDMAN'S HORMONE TEST FOR PREGNANCY. Thomas B. Magath and Lawrence M. Randall, Rochester, Minn. (*Journal A. M. A.*, June 6, 1931), believe that, although the hormone pregnancy test devised by Friedman, using urine which is injected intravenously into rabbits, is simple to perform, certain precautions are necessary. In the first place, the first urine passed in the morning should be used and should be injected within an hour, or the specimen should be kept on ice until it is used. Urine older than five hours probably bould not be used. If the urine is cloudy it should be filtered. Rabbits younger than two and a half months should not be used, and there is no objection to using old animals if they have not recently copulated. It is absolutely essential that rabbits be kept under such conditions as to insure their not being pregnant as well as not having recently copulated. If the rabbits are young, care will have to be exercised to be sure that females and not males are elected for the test, for the external genitalia are not so clearly recognized as in older animals. It is best to isolate animals in single cages for three weeks before using them, thus avoiding any of these difficulties. Sterile technic is not necessary, and from 7 to 15 cc. of urine should be injected slowly into the marginal ear vein of the rabbit. Thirty hours should elapse before the animals are examined, else the test may be indefinite. Positive tests are inorrhagica, which are detected by gross inspection. If these orrhagica, which are detected by gros inspection. If they are not clearly evident, the test had best be considered negative. In the author's series of positive animals, marked injection of the uterus and oviducts was striking. The test is both practical and accurate.

HYPEREMESIS GRADVIDARUM

THE UNDERLYING PRINCIPLES IN ITS TREATMENT*

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Vomiting of pregnancy often presents a problem to the general practitioner. Sixty per cent of women in the first trimester of pregnancy suffer from nausea, but only a small percentage require stringent treatment. It is with this minor fraction that the physician has difficulty and it is often a question as to what treatment will be most effective.

As with any other deviation from normal, the condition should be treated with the idea of restoring the altered physiology to normal. There are two types of nausea and vomiting, that due to psychic factors and that due to definite alterations in physiology. Frequently, if the first type persists, it merges into the second.

In speaking of the psychic factors, I have reference to those women who have long desired pregnancy and who feel that nausea and vomiting are a real part of it. When one of these women misses a period, she eagerly looks for the onset of morning vomiting to clinch the proof that she is pregnant, and when it appears, she gives it all the aid in her power. Also there are women who are resentful because they have become pregnant and who desire to show their husbands what they go through in having a baby. Many vomit and gag whenever there is an audience, particularly if the husband is present.

We know that pregnancy causes a marked carbohydrate drain on the mother and there are many women who in their daily diets are receiving just enough carbohydrates to maintain a normal blood sugar level, but who, with the onset of pregnancy and its increased carbohydrate drain, as well as the lowered renal threshold for glucose, are unable to maintain a normal blood sugar level. This drop in the blood sugar is the first demonstrable deviation from the normal.

Carlson has shown that a drop in the blood sugar is followed by marked gastric contractions. He has demonstrated that, by causing hypoglycemia, he can produce gastric contractions to the point of emesis.

The pregnant woman has nausea and vomiting because of hypoglycemia. As a result of deficient carbohydrate and alkali intake, there is an increase in the ketone bodies in the blood with resultant ketosis, as well as a true acidosis resulting from an uncompensated alkali deficit. Because of insufficient fluid intake, plus the loss by vomiting, there is soon marked dehydration and a vicious circle is established.

With these facts in mind, the treatment of hyperemesis becomes remarkably simple. There are two types, the mild and the severe.

TREATMENT OF MILD CASES

1. Fractional feedings, high carbohydrate, low fat. 2. Sedatives. 3. Rest.

1. Often those who are suffering from mild nausea and vomiting of pregnancy are nauseated at regular hours every day, usually in the morning before breakfast, about eleven a.m., commonly from four to four-thirty p.m., and frequently in the evening before retiring. This regularity in the appearance of nausea is not coincidental; it occurs because nausea increases as the stomach becomes empty. Hence, if instructions are given to eat small meals six or seven times daily, and to anticipate the onset of nausea by taking food, much distress can be alleviated. The food should be high in carbohydrate. Candy and sweets should be eaten in quantity and sweet wafers or graham crackers should be taken about forty-five minutes before rising in the morning.

2. It is our practice to give fifteen grains of triple bromides every four hours while the patient is awake.

3. Rest is imperative. Not only bed rest but freedom from social and household worries. A nap or a rest period of two hours each afternoon is of advantage.

When one considers the physiology in hyperemesis gravidarum, one can easily understand why placental extract, corpus luteum, ovarian extract, and various commercial preparations of mammary gland, etc. are of no value. As placebos, they may occasionally give results but distilled water would have the same effect. I have cured several mild cases with hourly doses of tincture of asafetida which we know is inert except for its terrible taste; it is easier to stop vomiting than it is to take asafetida. Psychology plays a part in the treatment, some writers believing that every case starts with a neurosis.

These mild cases are easy to treat and almost all of them will recover in a very short time, providing they are given sedatives and fractional carbohydrate feedings, plus what psychotherapy they require. They must be carefully watched, however, and guarded against the onset of acidosis and hypoglycemia.

TREATMENT OF SEVERE CASES

Women suffering from severe vomiting of pregnancy are not to be confused with those described above. These are ill, some extremely so, and must be treated intensively. Often they are not seen by a physician until they have been vomiting for some time and their condition has become grave.

Let us now consider the disease from the standpoint of the alterations in physiology and devise treatment on this basis, because this is the only scientific way to treat any patient, whatever the disease.

The condition is attended by five separate and distinct deviations from normal:

1. Pregnancy.

2. Hypoglycemia. I have yet to see a normal blood sugar report in connection with pernicious vomiting of pregnancy.

3. Ketosis, as evidenced by acetonuria and the acetone odor of the breath.

4. Dehydration.

5. Acidosis as evidenced by the almost invariable lowering of the alkali reserve of the blood. Occasionally enough hydrochloric acid is lost in vomiting to overshadow the alkali deficit and an alkalosis results. For this reason, an alkali reserve estimation should be made at the start of treatment.

It is unnecessary to consider termination of the pregnancy. I make this as a sincere, deeply considered statement. *These patients, without exception, will get well provided they are given adequate intensive treatment. Abortion has absolutely no place in the treatment of pernicious vomiting.* I have seen a woman practically moribund, who could not possibly have withstood the shock of even cervical dilatation, recover within a very few days upon adequate treatment. Titus has shown that the so-called acute yellow atrophy of the liver, which was previously supposed to cause considerable maternal mortality, is really acute fulminating hypoglycemia. Liver damage follows hypoglycemia.

The essential points in the physiologic treatment are:

1. *Isolation.* Hospitalization is imperative. They must have *no* visitors and this, as well as other items in their treatment, is difficult to enforce at home.

2. *Sedatives.* Veronal, gr. 10. Sodium bromide, gr. 60. Dissolve in 6 ounces tapwater. To be given as retention enema every six hours. This sedative or some similar one will keep the patient tranquil and free from worry.

3. *Nothing by mouth until ordered.* It is extremely important that this order be followed.

4. 300-500 *cc. of* 25 *per cent glucose* intravenously at least twice daily.

It has been shown by several investigators that this is the optimum concentration of glucose to be given. Glucose is given to achieve certain specific results; to correct hypoglycemia and to relieve ketosis. If laboratory facilities are available, frequent blood sugar readings may be taken and glucose given intravenously until the blood sugar has remained normal for several days and until the intake can be maintained by mouth. If no facilities are available for blood sugar estimations, glucose should be given until all acetone has disappeared from the urine for several days and until sugar spills over into the urine after each injection.

Early in the disease, before the blood sugar has dropped in amount, the glycogen (a colloidal polysaccharide synthesized from glucose by the body) which is normally stored in the liver has become depleted. This depletion is due to reconversion of glycogen into glucose in an effort to combat the approaching hypoglycemia. Hence, before a normal blood sugar level can be maintained, a normal amount of glycogen must have been again stored in the liver.

The acetonuria is evidence of ketosis and is due directly to the incomplete metabolism of fat. It may be considered that by the time vomiting has become severe, the patient is starving and is undergoing those alterations in metabolism which are caused by starvation. The body fat is broken down but there is not enough carbohydrate intake for its complete oxidation. The complete combustion of each molecule of fat in the process of fat metabolism requires a molecule of carbohydrate in the form of the monosaccharide, glucose, to furnish the oxygen needed to reduce the fat to carbon dioxide. and water.

Briefly this is the chemistry involved: fats are solid esters of glycerol and a fatty acid.

> Acetoacetic acid[1] is a normal intermediate product in the oxidation of the acids that occur in combination with glycerol as fats, and of certain amino acids (leucin, tyrosin, phenylalanin, and histidin) from proteins. In normal metabolism it is quickly oxidized to carbon dioxide and water and so is never excreted in the urine. However, it has been shown that dextrose must be oxidized in order that this complete oxidation of a ketone acid may occur,

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[1] Osgood, E. E. and Haskins, H. D.: Laboratory Diagnosis, p. 58. P. Blakiston's Son & Co., 1931.

and also that there is a quantitative relation between the amount of dextrose which is being oxidized and the quantity of acetoacetic acid that can be oxidized. For every molecule of dextrose oxidized, one molecule of acetoacetic acid can be completely oxidized. Hence, if the metabolism can be so adjusted that one or more molecules of dextrose is oxidized for each molecule of acetoacetic acid that is formed, ketosis will not occur. If more than one and less than two molecules of acetoacetic acid are formed for each molecule of dextrose that is being oxidized. slight ketosis occurs, although some of the excess acetoacetic acid beyond one molecule is oxidized. If over two molecules of acetoacetic acid are formed for each molecule of dextrose oxidized, none of the excess acetoacetic acid beyond the two molecules is oxidized, and a marked ketosis results.

For this reason it may be seen why acetone ($CH_3.CO.CH_3$), which is derived from acetoacetic acid by the loss of CO_2, is present alone in the urine of mild cases and in severe cases in association with acetoacetic acid ($CH_3.CO.CH_2.COOH$), or with both acetoacetic acid and beta-hydroxybutyric acid ($CH_3.CHOH.CH_2.COOH$) which is derived from acetoacetic acid by reduction.

5. *Normal saline solution.* The quantity of saline solution needed will depend upon the degree of dehydration. Not less than 2000 cc. should be given daily by hypodermoclysis or 1000 cc. given intravenously at least *twice* daily. No hesitancy need be felt in giving large amounts of fluid intravenously, providing it is given slowly. We have given as much as 7000 cc. of fluid in twenty-four hours, 3000 cc. of it intravenously and 4000 cc. by hypodermoclysis.

6. *Alkali.* Because two of the ketone bodies, acetoacetic acid and beta-hydroxybutyric acid, are acids, a prolonged ketosis is apt to result in an acidosis. If these two acids are neutralized by the buffers of the blood and excreted without replenishment of the alkali used in the neutralization, a definite uncompensated alkali deficit is the result. For this reason, if the alkali reserve of the blood is low and does not return to normal following the administration of glucose, a three or four per cent solution of sodium bicarbonate may be given by rectum.

In case the alkali reserve should show an alkalosis to be present, very dilute hydrochloric acid or sodium acid phosphate may be given by proctoclysis.

Up to this point, nothing has been taken by mouth. Intensive treatment has been given intravenously, subcutaneously and by rectum, and within a short time, depending upon the severity of the condition, the blood chemistry should be normal. We now allow sweetened fruit juice in dram doses at intervals of ten minutes, keeping the patient on her right side so that the fluid does not collect in the stomach. As this is retained, the amounts may be increased so that in twelve hours considerable fluid and carbohydrate may be taken in this way. When a thousand cc. of fruit juice and fluids can be retained in twenty-four hours, the intravenous administration of glucose is stopped and the following day small fractional feedings of solid food, carbohydrates and proteins are allowed and increased quite rapidly. Henceforth, a high carbohydrate diet is given.

A physiologic normal has now been established, with the exception of pregnancy, and it is only necessary for the woman to realize that she can again take food. When this is accomplished, a very rapid convalescence follows and, providing the diet is adequate in carbohydrates from this time on, there will be no serious recurrence of trouble. It is well, however, to keep the patient in the hospital for at least four days after she is able to take solid food, withdrawing the rectal sedatives slowly and substituting sedatives by mouth.

Psychology here plays its greatest role; some convalescents do not want to go home where household duties must again be assumed. Occasionally it is necessary to threaten to terminate the pregnancy in order to stop the purely voluntary regurgitation of food. While considerable attention should be given to the nausea and vomiting and the physiologic needs treated with considerable nicety of judgment, it is possible to obtain uniformly good results by keeping in mind at all times the underlying changes in physiology.

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OBSERVATIONS ON EFFICIENCY OF COMMONLY USED HYPNOTICS. G. P. Grahfield, Boston (*Journal A. M. A.,* May 30, 1931), describes the observations he made in a comparison of the efficiency of commonly used hypnotic drugs. It occurred to him that a rough index of efficiency might be obtained by prescribing half the amount of the recommended doses and noting the number of doses that were required to produce a comfortable night's sleep. In this way the number of patients used, divided by the number of doses required, would give a rough index of efficiency. If the accepted dose, under such circumstances, was the correct one the indexes should run about 50 per cent. In deciding on the dose either half the pharmocopeial dose or half the dosage recommended by the manufacturer, in the case of a proprietary drug, was used. While the indexes were much higher, this method proved satisfactory. Two series of experiments were done, in the first of which a senior house officer was asked to prescribe to drug by name, and in the second one of which he was given the drug in a numbered bottle to be dispensed in the ward according to a given dosage. The drugs selected are either in the U. S. Pharmacopeia or in the accepted list of New and Nonofficial Remedies. In only one case did the newer drug show any great advantage over the older ones of the same chemical group, and that was in the case of sahromin, which has certain chemical features that differentiate it from other bromide hypnotics, but the slightly increased efficiency does not compensate for the greatly increased cost.

RELATIONSHIP OF QUININE TOLERANCE TO THYROID SECRETION

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The apparent antagonism of quinine to excessive thyroid hormone has occasionally been stressed by other observers. Nearly a half century ago Forscheimer[1] found the neutral hydrobromide of quinine of marked benefit in the treatment of exophthalmic goiter. Experimenting on tadpoles, Krosynski and Modrakowsky[2] found the physiologic action of quinine opposed to that of thyroxin. Kleinschmidt[3] found the administration of quinine hydrobromide instead of iodine as a preoperative and postoperative treatment very useful in more than fifty cases of exophthalmic goiter; the results speak very favorably as compared to controls in which no quinine was given. Benhamou[4] reports the case of a woman of forty-five, to whom he administered quinidine for paroxysmal tachycardia. She had had an oldstanding goiter which suddenly increased in size with the aggravation of the paroxysmal tachycardia prior to treatment with quinidine. The result of the quinidine treatment was a stabilization of the heart's action and a decrease in the size of the goiter which eventually disappeared.

While it cannot be said that a mere drug can effect recovery in hyperthyroidism, the above observations, coupled with our own in which at least 60 per cent of patients were clinically improved by quinine given in maximal doses, furnish food for thought. From the evidence at hand it would appear that the physiologic action of quinine favors either a curbing of excessive thyroid output, or a neutralization of excessive thyroxin in the blood or both. Whatever the explanation, it is a fairly safe assumption that, while quinine is not the mainstay in treatment, it is a very useful ingredient in therapeusis of these patients, irrespective of whether the treatment is basically surgical, roentgenologic or medical. Also, the virtues of quinine administration as an index of the presence and severity of thyroid hypersecretion deserve widespread consideration.

THE QUININE TEST FOR HYPERTHYROIDISM

Continuing the studies of some years ago,[5] I recently reported the results of observations in a series of 500 cases of exophthalmic goiter, in which it was revealed that 95.6 per cent tolerated from 30 to 90 grains (1.9 to 5.8 gm.) of quinine sulphate daily for weeks without evidences of cinchonism.[6] I pointed out that the relative immunity to cinchonism enjoyed by these patients lends itself to the adoption of the quinine test for hyperthyroidism, the technic of which is as follows:

> The patient is given a dozen capsules, each containing 10 grains (0.65 gm.) of quinine sulphate, with instructions to take a capsule four times a day. When 20 or 30 grains (1.3 or 1.9 gm.) have been taken by persons in whom thyroid function is normal or deficient, symptoms of cinchonism develop. A sense of fulness in the head, impaired hearing with tinnitus, occasional dizziness and headache, and less frequently gastric and bladder discomfort are experienced. If, however, the person is suffering with hyperthyroidism, the daily administration of 30 grains of quinine may be continued with impunity for months, and often with distinct improvement in the clinical picture.

During the past three years 300 additional patients were studied for quinine tolerance with confirmatory information on this interesting subject. Of this series 124 were cases of exophthalmic goiter or Graves' disease and 176 were instances of toxic adenoma, making a grand total of 800 cases thus studied. The following table of data is available on the entire series:

Tolerance for Quinine in 800 Cases of Hyperthyroidism

Quinine negative:	Per cent
Patients sensitive to quinine	9 (1.1)
Patients tolerating 15 grains (0.9 gm.) daily	25 (3.1)
Quinine positive:	
Patients tolerating 30 grains (1.9 gm.) daily	266 (33.3)
Patients tolerating 40 grains (2.6 gm.) daily	168 (21.0)
Patients tolerating 60 grains (3.9 gm.) daily	145 (18.1)
Patients tolerating 80 grains (5.2 gm.) daily	105 (13.1)
Patients tolerating 90 grains (5.8 gm.) daily	82 (10.3)
Total	800

In this series there were 34 (4.25 per cent) who were quinine-negative, nine of whom presented varying degrees of quinine sensitivity. In the remainder of the total of 800 cases studied there was tolerance for quinine, varying in dosage from 30 grains (1.9 gm.) to 90 grains (5.8 gm.) a day for at least three weeks in each case.

The number of male patients predominated among those able to take the largest doses of quinine. Also, following the ingestion of quinine there occurred in at least 60 per cent of this series such evidences of general improvement as increased weight, lessened excitability and tremor, improved sleep, and a reduction in heart rate and basal metabolic rate.

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[1] Forscheimer, F.: Forscheimer's Therapeusis of Internal Diseases, III, 899, (Appleton) 1917.

[2] Kroszynski, S. and Modrakowsky, S.: Antagonistic Acton of Thyroid Extract and Quinine. Compt. rend. Soc. de Biol., 93:939-942, Oct. 23, 1925.

[3] Kleinschmidt, O.: Quinine in Exophthalmic Goiter. Zentralblatt f. Chir., 50:1417-1488, Sept. 15, 1923.

[4] Benhamou, E.: Effect of Quinidine on Arrhythmia with Goiter. Paris Med., 13:235, Mar. 10, 1923.

[5] Bram, I.: Quinine Test, Med. Rec. 98:887, 1920; Quinine Test, Second Report, N. Y. M. J., 118:339, 1923; Goiter: Nonsurgical Types and Treatment, 1924, p. 238. The Macmillan Company, New York.

[6] Bram, I.: Tolerance for Quinine in Exophthalmic Goiter. Arch. Int. Med., 42:53, 1928.

The frequency of error noted in the total of 800 cases studied was less than 5 per cent. The advantages of the quinine test are its simplicity and relative dependability. The results are not influenced by emotionalism nor are such factors as transient nervousness and errors in technic involved. Moreover, the test requires no "basal conditions" for its use, the patient requiring no preliminary period of rest or starvation. Among others who have commented on the quinine test for hyperthyroidism are Sainton and Schulman,[7] Pfahler,[8] and Parisot and Richard.[9]

The quinine test does not discriminate between toxic adenoma and exophthalmic goiter. This differentiation requires not laboratory but clinical application. While in a general way it is felt that the average patient with exophthalmic goiter is somewhat more tolerant to quinine than is the average sufferer from toxic adenoma, observations thus far have not yielded definite views on this point.

RELATIVE VALUE OF QUININE SULPHATE AND QUINIDINE SULPHATE

Observations in this study, to ascertain what differences, if any, exist between results from the use of quinine sulphate and quinidine sulphate, yielded fairly definite information in a series of forty sufferers from hyperthyroidism with and without Graves' disease. There is sufficient evidence to indicate that tolerance is increased by approximately 20 per cent for quinidine as compared to quinine; that in occasional instances of sensitivity to quinine, quinidine in judicious doses is tolerated for a reasonable period of time; and that skin manifestations in particular are not as prone to appear following quinidine administration as compared with quinine. From a therapeutic point of view it was seen that cardiac irregularity, especially the auricular fibrillation encountered in hyperthyroidism, is more promptly controlled by quinidine. Further data on these points are being accumulated.

QUININE-NEGATIVE CASES

Judging from the cases studied, it is apparent that in at least 95 per cent the element of hyperthyroidism must be present in order that the quinine test be positive and a relative immunity to cinchonism be expected. In other words, patients able to tolerate 30 or more grains of quinine sulphate a day present the most important evidences of hyperthyroidism, *afebrile heart hurry* and a *heightened metabolic rate*. This was emphasized when it was observed that, barring the occasional rare instance of quinine sensitivity in this series, most of the patients with mild evidences of cinchonism without skin manifestations (i.e., slight fullness in the head and tinnitus) were sufferers from Graves' disease, the metabolic rate of which was within normal limits.

Clinicians who see many cases of Graves' disease now realize that a heightened metabolic rate is occasionally conspicuous by its absence in an otherwise typical syndrome. Despite heart hurry, trembling, loss in weight, exophthalmos, emotionalism and nervousness, in some instances of active Graves' disease the element of hyperthyroidism *per se* may not be demonstrable as pointed out in another communication.[10] In my experience approximately 1.5 per cent of subjects of Graves' disease present no rise in metabolism and are likely to be quinine-negative. Among these are included cases of thyroid quiescence due to remission of the syndrome following thyroidectomy, roentgen-ray treatment, iodine administration, or as a result of spontaneous involution. While exophthalmos, heart excitability, tremor and fatigability may still prevail to an extent, the thyroid gland is not in a state of hyperactivity.

QUININE TOLERANCE BY THYROID NORMALS

In quinine-negative persons it is found that after taking two or three capsules of quinine sulphate, each containing 10 grains (0.65 gm.) at approximately four-hour intervals, the typical head and ear symptoms of cinchonism develop, indicating intolerance to this dosage. In order to ascertain the amount of quinine tolerated by normal controls, I succeeded in January, 1930, in enlisting the services of eight apparently normal adults of average size and weight, varying in age between 20 and 41 years. Four were man and four women. The period of observation was two weeks in each subject. Head and ear symptoms were indices of intolerance, and quinine sulphate in evenly divided doses five or six hours apart t.i.d. was given. Two subjects were able to tolerate 12 grains daily; three could take but 9 grains a day; two could not exceed 6 grains, and one developed cinchonism when the dosage exceeded 3 grains daily. According to this group the average normal person can tolerate 8.25 grains of quinine sulphate a day for two weeks without experiencing symptoms of cinchonism.

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[7] Sainton, P. and Schulman, E.: Value of Bram Quinine Test in the Diagnosis of Exophthalmic Goiter (sur la valeur du test de Bram a la quinine comme moyen de diagnostic du goitre exophthalmique). Bull. et mem. Soc. med. d. hop. de Paris, 45:1304, 1921.

[8] Pfahler, G. E.: The Treatment of Hyperthyroidism by Radiation. M. Clin. N. Amer., 5:854, 1921.

[9] Quoted by M. Breitman (Leningrad), in Max Hirsch's "Handbuch der Inneren Sekreten" (Leipsig), 1929, p. 1834.

[10] Bram, I.: Exophthalmic Goiter and Its Basal Metabolism: Conclusions Drawn from Over Thirty Thousand Metabolic Tests. Med. J. and Rec., 119: 574-577, 1929.

SENSITIVITY TO QUININE

Sensitivity to cinchona and its derivatives may occur where least expected, so that when administering quinine either as a test or as a therapeutic measure, the medical attendant should see the patient daily for the first few days. In our total of 800 cases there were nine patients, in whom intolerance was associated with more or less troublesome symptoms particularly referable to the skin. A glance at the experiences of others may assist in the appreciation of the importance of quinine sensitivity.

Gustafson[11] reports a case of severe idiosyncrasy to quinine discovered in a patient, in whom quinine was used rectally in 20 grain doses for analgesia. Larregla[12] reports the case of a girl of 16 who developed marked symptoms of sensitivity when quinine sulphate was administered for influenza. Burgess and Usher[13] call attention to the increasing number of cases of mild to severe eczema of the face which apparently resulted from a sensitivity of the individual to alcoholic lotions containing quinine. Their observations were based upon a study of 200 persons from the dermatologic clinic of the Montreal General Hospital.

Dawson and Garbade[14] report in detail a case of quinine and cinchonidine idiosyncrasy demonstrable by Boerner's test.[15] They call attention to the fact that these substances are levorotary; in this case idiosyncrasy was not present to the dextrorotary isomers of these substances, one of which is quinidine. To quote, idiosyncrasy in this case "was discovered through the oral administration of a capsule containing 5 grains (0.325 gm.) of quinine sulphate. Within ninety minutes cinchonism appeared, characterized by dizziness, tinnitus, nausea and vomiting. About ninety minutes later symptoms of quinine idiosyncrasy were marked, with intense urticaria, alarming dyspnea and abundant nasal discharge. Within three hours more the violence of the reaction had considerably abated, and ninety minutes later the only traces were some areas of erythema." In the opinion of these authors a positive Boerner's reaction probably means that the patient will have great discomfort from the administration of the drug; a negative reaction, on the other hand, does not preclude the occurrence of urticaria. Patients presenting an idiosyncrasy to quinine may be found tolerant to quinidine.

Boerner,[15] himself sensitive to quinine, describes his test as follows:

> The method of conducting the test is similar to the cutaneous tuberculin test (von Pirquet) with quinine sulphate as antigen. The forearm is cleansed with alcohol and dried. Two abrasions are made with a needle, about three inches apart. The scarifications are just deep enough to remove the superficial layers of the skin. To one of these abrasions powdered quinine sulphate is applied. The other is left untouched to show the amount of irritation produced by traumatism. In about five minutes the abrasion to which the quinine has been applied begins to itch slightly. This is followed by slight edema along both sides of the pin mark which in ten minutes becomes very pronounced. At the end of fifteen minutes the reaction is at its height, and at this time is surrounded by a zone of erythema presenting a mottled appearance and extending over an area about one inch in diameter. Instead of powdered quinine sulphate, a solution of quinine bisulphate in 1:10 dilution with normal salt solution may be used.

Our cases of sensitivity to quinine could probably have been apprehended, had the Boerner test been applied prior to quinine ingestion. The rare case of cinchonism in the presence of thyroid hypersecretion may take on a mild, moderate or severe form. Also, evidences of sensitivity may appear suddenly and sharply after the first or second dose, or the symptoms may develop only after considerable accumulation of the drug has occurred. The dosage of quinine resulting in manifestations of sensitivity varies greatly. While in one patient but half a grain of quinine or less may yield rather uncomfortable symptoms within an hour or two, in another these symptoms do not occur until 30 or 40 grains or more distributed over a few days have been taken. The following case histories of patients observed in our series are illustrative:

Case 1. Mr. B., age 54, was suffering with a very severe form of exophthalmic goiter of probably six or seven years duration. The basal metabolic rate was plus 55 per cent; thyroid gland, while not visibly enlarged, presented on palpation considerable hyperplasia with a tendency toward substernal location; the heart was moderately degenerated, impetuous in action with auricular fibrillation and a pulse deficit of approximately fifty beats per minute; there was moderate arterial hypertension; there was a loss of about forty pounds in weight; marked tremor, insomnia, nervousness, restlessness, hyperidrosis, dermographia, and all other typical signs and symptoms. Exophthalmos, particularly of the right eye, was so marked as to occasion continuous lachrymation and injection of the conjunctiva.

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[11] Gustafson, G. W.: Quinine Reaction following Rectal Analgesia. Am. Jour. Obst. and Gyn., 18:877, Dec., 1929.

[12] Larregla, S.: Quinine Allergy. Siglo Medico (Madrid), 85:661, June 21, 1930.

[13] Burgess, J. F. and Usher, B.: Hypersensitiveness to Quinine. Can. Med. Assn. Jour., 23:45, July, 1930.

[14] Dawson, W. T. and Garbade, F. A.: Idiosyncrasy to Quinine, Cinchonidine and Ethylhydrocupreine. J. A. M. A., 94:704-705, Mar. 8, 1930.

[15] Boerner, F. Jr.: A Skin Reaction to Quinine. J. A. M. A., 68:907-908, Mar. 24, 1917.

The rest cure combined with a forced feeding dietary characterized by a marked restriction in animal proteins was prescribed, and 10 grains of quinine sulphate t.i.d. was given. During the first week an occasional small dose of luminal or barbital was administered to overcome insomnia.

The patient progressed rather satisfactorily during the first two weeks of treatment. The heart became rhythmical with a rate of 80 to 84 per minute, the nervous symptoms had largely disappeared, the food intake was quite satisfactory, there was a gain of 6 pounds in weight, and the basal metabolic rate was reduced to plus 26 per cent. At this point, almost suddenly, the patient began to complain of an itching of the skin.

Examination revealed what appeared to be urticaria. Medication was stopped, but the patient became worse. Within twenty-four hours he was covered with a scarlatiniform rash and the itching became intolerable. The next day the face and eyes were swollen to almost the appearance of a case of dermatitis venenata. The mucous membrane of the mouth and tongue was also swollen. Because of difficulty of mastication and swallowing and the extreme nausea, the patient was unable to take more than a small amount of liquid food. The temperature rose to above 102° F., nervousness and restlessness were extreme, and marked weakness bordered on prostration. Within seventy-two hours dyspnea was also evident, with a return of auricular fibrillation. Strangely, while the patient complained of some headache, there were no ear symptoms. On the fourth day some of the vesicles which had been present on the face, hands and feet for the past forty-eight hours began to break open, and shortly thereafter, scab-formation was evident. It required fully two weeks to clear up this case of quinine sensitivity. At the termination of the tenth day not alone did the scabs begin to fall off, but the large areas of scarlatiniform manifestations began to peal not unlike what is observed during the desquamation period of scarlet fever.

The next case required but a day or two of quinine administration to indicate that the patient was highly sensitive to the drug.

Case 2. Miss W., age 16, was suffering with exophthalmic goiter of approximately one year's duration. The basal metabolic rate was plus 68 per cent, the heart rate 140 per minute, the weight was reduced by about twenty pounds, although the patient still appeared very well nourished. The thyroid gland was rather prominent and highly hyperplastic, with throbbing, thrill and bruit. Tremor, dermographia and hyperidrosis were present in typical form, and the eyes were moderately exophthalmic. The patient was rather high strung, exceedingly emotional, and suffered with complete insomnia.

A probationary regime of therapeusis included the rest cure, an ample dietary characterized by a minimum of animal proteins, and the administration of quinine hydrobromide, gr. v, t.i.d. In a week's time the patient complained of marked itching of the skin, but no rash was evident. Believing this complaint to be of no consequence (since many subjects of exophthalmic goiter complain of itching of the skin), no attention was paid to this symptom.

Within a few days the skin was covered with a papular eruption which was universally distributed and distressingly itchy. Nervousness and restlessness were increased, the pulse rate rose to 160 per minute, and there was a rise in temperature to above 100°. At this point medication was stopped, for it was evident that the patient was suffering with quinine sensitivity. A few days later the entire skin presented an erysipelatous appearance, with here and there groups of vesicles. During this time the patient suffered with distressing headache and impaired hearing. At approximately the tenth day of the onset of skin manifestations, the vesicles yielded to scab formation, and shortly thereafter, these loosened up during the process of furfuracious desquamation elsewhere.

After complete recovery from these symptoms, I thought it well to determine in this case just how small a dose of quinine the patient could take without evidences of sensitivity. Accordingly, quinine hydrobromide gr. ½, was administered, with orders to take a dose night and morning. Three hours after the first dose, the patient telephoned the news that the former rash and itching were returning. She was instructed to appear at once for an examination, and true enough, it was very evident that here we must never permit the use of quinine in any dosage whatever.

VARIATIONS IN QUININE TOLERANCE IN THE SAME PATIENT

In the average case of hyperthyroidism quinine tolerance appears to vary directly with the severity of the symptoms, and the degree of tolerance runs fairly parallel with the heightening of the basal metabolic rate. Early or mild cases usually tolerate 30 grains or more of quinine sulphate daily in the presence of a basal metabolic rate varying from plus 30 to plus 40 per cent. In the average sufferer with a metabolic rate of plus 50 or over, and during crisis, quinine tolerance may be increased to 90 grains daily and, in a few instances in our series, even higher.

As a result of the curbing of thyrotoxicity following thyroidectomy, roentgen-ray treatment, iodine administration or spontaneous remission, quinine tolerance is correspondingly reduced, here also in proportion with the lowering of the basal metabolic rate. When a relapse or recurrence presents itself, the amount of quinine the patient can take without cinchonism is again increased. If, spontaneously or otherwise, there occurs a dominating hypothyroidism or myxedema, the patient approaches the status of the quinine-negative individual.

When, while under treatment, a patient formerly tolerant to large doses of quinine now begins to complain of head and ear symptoms, it is invariably found that the basal metabolic rate, too, is approaching or has become normal. Formerly capable of tolerating from 30 to 90 grains of quinine sulphate daily, such a patient now becomes quinine-negative.

From the experience derived from this series of patients it would appear that the degree of quinine tolerance manifested by the individual is a fairly satisfactory index of the degree of thyroid function. While precise figures have not yet been worked out, it appears likely that further investigation may determine the quinine tolerance of a given subject of hyperthyroidism to be quite as reliable an index of the presence or severity of the disease, and of the progress toward recovery, as is the basal metabolic rate.

QUININE TOLERANCE IN HYPOTHYROIDISM

In May and June, 1929, I conducted observations in a group of twelve patients, presenting metabolic rates varying from minus 14 to minus 35 per cent. The average metabolic rate was minus 18 per cent. All were quinine-negative. While no clear parallelism could be discerned between the degree of thyroid underfunction and quinine intolerance, it was observed that those whose metabolic rating was higher could take more quinine. Thus, in two cases with myxedematous manifestations and a metabolic rate of minus 30 and 34 per cent respectively but 3 grains of quinine could be taken daily for a week, following which tinnitus appeared and the drug was withdrawn. On the other hand, three patients, presenting a metabolic rate of minus 14 to minus 16 per cent, tolerated 12 grains daily for ten days without complaints. The average tolerance for quinine by this group of hypothyroids was 5.3 grains a day for at least a week, somewhat less than the tolerance by thyroid normals.

PROBLEMS SUGGESTING THEMSELVES

The foregoing remarks strongly suggest the value of quinine as an index in the diagnosis and progress of hyperthyroidism, and as an asset in treatment. Other problems suggesting themselves in this connection are: (1) Can quinine tolerance be artificially increased by thyroid ingestion? (2) Is the occasional reported instance of benefit in Graves' disease by thyroid opotherapy a quinine-negative case? (3) Is a previously normal person who is made toxic by the ingestion of thyroid substance made more tolerant to quinine? (4) What is the quinine tolerance in cases of so-called iodine-Basedow? The answers to these and related questions would awaken much interest in a fascinating subject.

CONCLUSIONS

1. As the result of observations in a total of 800 cases of hyperthyroidism, it appears that the quinine test for thyrotoxemia is a dependable guide in diagnosis, the frequency of error not exceeding 5 per cent. As with basal metabolic studies, the test does not discriminate between toxic adenoma (true hyperthyroidism) and exophthalmic goiter (Graves' disease).

2. The tolerance for quinine by subjects of hyperthyroidism appears to vary in direct proportion with the height of the basal metabolic rate, and is fairly parallel with it, thus serving as a guide in progress of the disease. Depending upon the severity of active hyperthyroidism, patients are capable of taking from 30 to 90 grains of quinine sulphate daily for weeks without evidences of cinchonism.

3. In the occasional instance of a quinine-negative subject, who was an otherwise typical case of exophthalmic goiter, it was discovered that we were dealing with an uncommon case of active Graves' syndrome, apparently without the element of hyperthyroidism. In these patients, despite nervousness, sweating, wasting, exophthalmos, heart hurry, trembling, etc., the basal metabolic rate remained within normal limits.

4. Maximal doses of quinine sulphate given to the average sufferer from hyperthyroidism have proved to be of distinct benefit in over 60 per cent of our series and may be regarded as a valuable asset in the treatment of these patients.

5. From the evidence herein presented it would appear that the physiologic action of maximal doses of quinine favors either a curbing of the elaboration of excessive thyroid hormone, or a neutralization of excess blood-thyroxin. or both.

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Tic of Diaphragm (Postencephalitic) Relieved by Resection of Phrenic Nerves. P. G. Skillern, South Bend, Ind. (*Journal A. M. A.*, June 20, 1931), believes that postencephalitic diaphragmatic tic is apparently due to central (toxic?) stimulation of the phrenic nerves and that nothing short of total ablation of both phrenic nerves will effect a permanent cure. He reports a case with the following points of interest: (1) normal chest movements supplanted by rapid and shallow excursions of the thorax governed by daiphragmatic spasms at the rate of about 200 a minute; (2) disappearance of the spasms and restoration of normal movements immediately after resection of both phrenic nerves; (3) reappearance of the spasms nine months after operation; (4) disappearance of the spasms and restoration of normal movements again after total avulsion of the left phrenic nerve; (5) reappearance of the spasms six weeks after the second operation; (6) final disappearance of the spasms and restoration of normal movements after avulsion of the regenerated right phrenic nerve.

PAIN OF RENAL ORIGIN*

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It is often of the greatest importance to be able to diagnose the source of pain before the patient is put through a series of clinical and laboratory tests, some of which may be unnecessary, costly and time consuming. The oft repeated instruction, to get a painstaking history applies here, namely, the onset, chronology, location, fixed, radiating, dull, sharp, constant, intermittent or colicky.

Pain may be due to infection, malposition of the kidney, anomalies, obstruction, tumors or calculus. For convenience sake, they may be classified as follows:

- A—Infections
  - 1. Cortical abscess.
  - 2. Pyelitis.
  - 3. Pyonephrosis.
  - 4. Nephrolithiasis with infection.
  - 5. Tuberculosis.
- B—Anomalies
  - 1. Horseshoe or fused kidney.
  - 2. Aberrant blood vessel.
  - 3. Polycystic kidney.
- C—Obstructions
  - 1. Nephroptosis.
  - 2. Hydronephrosis.
  - 3. Calculus in pelvis.
  - 4. Stricture of ureter.
- D—Others
  - 1. Tumor.
  - 2. Calculus in calices or cortex.
  - 3. Nephralgia.
  - 4. Nephritis.
  - 5. Drugs—copaiba.
  - 6. Trauma.

INFECTIONS

1. The pain of cortical abscess is fixed, dorsal, usually at the costovertebral angle, unilateral though it can be bilateral, is constant and when large, throbbing. Retraction of thigh is not uncommon. There is also pain on motion of the vertebrae, as bending in any direction or jarring the body. In addition, there is a localized tenderness. Fever, leucocytosis, and history of carbuncles help in the diagnosis.

2. The pain of pyelitis is usually acute, sudden in onset, both intermittent and constant, the first being a colic and the second a dull ache. As a rule, it radiates along the ureter. The most intense pain and soreness is in the costovertebral angle. It is usually bilateral with one side much more tender than the other. Sharp and high elevations of temperature, and marked leucocytosis plus pyuria assist in the diagnosis. There are also the usual symptoms of a profound infection, prostration, nausea, vomiting, perspiration and delirium.

3. Pyonephrosis being a subacute or chronic disease, we expect milder symptoms. The pain is usually dull in character, and on deep pressure or percussion of the costovertebral angles is elicited, being either uni- or bilateral. Occasionally the pain may radiate or give colic, if the ureter becomes occluded with pus. Symptoms of a urinary infection are usually present, such as fever, loss in weight, secondary anemia and pyuria. Catheterization of the ureters will determine the character and source of the infection, also the relative renal function. Essentially, pain is a mild symptom of this disease.

4. Nephrolithiasis with infection produces a variety of pains. It is usually dull in character, does not radiate unless the ureter becomes temporarily occluded at the uretopelvic junction and is intermittent, depending largely upon the motion of the body. The pain is relieved by reclining. Other symptoms confirming it are intermittent hematuria of red blood cells in the urine, pyuria and localized tenderness over the kidney involved. Of course, a renal study, including roentgenograms, makes the diagnosis certain.

5. Pain in renal tuberculosis is often absent until later in the disease. Mostly it is a dull ache and only manifests itself after fatigue. It is always intermittent when present. When the ureter becomes occluded with pus clots or debris, a typical picture of renal colic is seen. The pyuria, presence of acid-fast bacilli, pus without the finding of bacteria, loss in weight and frequent micturition point to this diagnosis. Uroselectan is most valuable in the diagnosis of renal tuberculosis, both as to indicating function and demonstrating cavities in the kidney or pathology of the ureters. Occasionally pain is experienced in the good kidney, due to temporary engagement.

ANOMALIES

1. Fused or "horseshoe" kidneys usually are placed low in the abdomen with the bridge at the lower pole. The renal nitches are deep, the bodies of the vertebrae raised and the aorta on top of this; hence, the fused portion of the kidney rests upon the aorta. It is a dull ache, rather constant and not relieved by posture. Division of the isthmus has been suggested as a cure.

2. Aberrant vessels, by interfering with the emptying of the renal pelvis, cause considerable pain at times. These vessels usually cross at the lower

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pole, and with rotation or sagging of the kidney cause a characteristic deformity. The pelvis becomes ball-shaped, dilatation of the calices results and a sharp line is drawn between the bulging pelvis and slender ureter. The pain of this condition is a mild colic with a feeling of distention. The pain is usually localized, though it may be reflected down the ureter.

3. Polycystic kidney causes pain largely because of its weight. The pain develops slowly and often exists for years. The pull on the renal pedicle by these huge kidneys is sufficient cause of pain. In character it is a dull ache, rarely a colic. It is usually intermittent. Other symptoms helping in the diagnosis are intermittent hematuria, a palpable tumor in the kidney region, and decreased renal function, especially as indicated by the phenolsulphonephthalein test. Usually the condition can be diagnosed by palpation, as the kidneys often extend to the pelvis and the cysts on its surface can easily be felt. Pyelograms are always typical, large, rounded, partly filled cavities.

OBSTRUCTIONS

1. Nephroptosis, when associated with obstruction, causes two types of pain. When the obstruction is brought on suddenly by rotation of the kidney or an angulation of the ureter due to sudden ptosis, the pain produced is usually a colic. It often is mistaken for the pain of a renal calculus, as it radiates in a similar manner. It may occur while walking, sitting or simply turning over in bed. Red blood cells or hematuria may occur further, suggesting stone. The second type of pain is a dull ache, due to an unemptied renal pelvis. This is localized in the back and persists until the obstruction has been relieved. These pains are intermittent. When the flow of urine is free, the patient feels perfectly well. Renal studies, palpations of the movable kidney and a corrective support of the abdominal wall confirm the diagnosis.

2. Hydronephrosis without infection produces a low degree of pain in the costovertebral angle. It is more constant than periodic. At times it is absent entirely. In other cases, when total obstruction occurs, as the shifting of a calculus or rotation of the kidney, typical colic will be produced. These bring on nausea, vomiting and suppression of urine. The point of obstruction colors the character of the pain. A low obstruction of the ureter will produce a radiating colic, while with a high one, the pain will be confined to the kidney. Intermittent hematuria is commonly present. Rarely is there fever, even when infection exists. The urine may be negative in every particular. When the hydronephrosis is large, a palpable tumor of the loin may be felt with moderate tenderness. Catheterization of the ureters, divided functional tests and pyelograms clarify the diagnosis.

3. Calculi in the renal pelvis are of two types, obstructing and nonobstructing. These stones, which intermittently shut off the outflow at the ureteropelvic junction, gradually produce a hydronephrosis, often of great size. The pain is sudden in onset, colicky, and tends to remain in the small of the back. After the sharp pain wears off, it is replaced by a dull ache, lasting from a few hours to a few days. Hematuria usually accompanies the colic. Heavy percussion over the costovertebral angles is nearly always positive in the presence of calculi.

4. Stricture of the ureter at the pelvic junction also produces colic, due to obstruction. At certain times changes occur in the mucosa of the ureter, an acute swelling takes place, and retention of urine in the pelvis and calices results. This will bring on a sense of fullness and severe aching until the obstruction subsides and the pelvis gradually empties. Usually the urinary findings are negative. These cases are usually wrongly diagnosed, especially if the right kidney is involved. This condition is best demonstrated by intravenous urography or the bulbed bougies. In other cases, typical renal colic occurs at more or less regular intervals. Dilatation makes these patients very grateful ones.

OTHER CAUSES

1. Renal neoplasms, as papillary carcinoma, hypernephroma, solitary cysts (simple and hemorrhagic), sarcoma and others are productive of renal colic and hematuria in a large percentage of cases. The colic is intermittent and produced by blood clots obstructing the ureter. A palpable kidney mass with secondary anemia and diffuse, or fixed renal pain are further suspicions. Pyelograms are valuable aids in diagnosis, showing compression or obliteration of parts of the calices. Cysts produce no distinct pain and are limited to a dull ache in the loin, depending upon the size of the cyst, which may be quite small or entirely fill the abdominal cavity.

2. Calculi occupying the calices or in the cortex may give no pain. When it does, it is a dull ache, and it does not radiate. Often we see stag horn or coral stones, forming a complete cast of the pelvis and calices with very little pain, a mild "stitch in the back," which is intermittent. Drainage is not

interfered with, so colic is not produced. If the calculus is small, it may travel from a calix to the pelvis, produce colic, then slip back into the calix. These are often called the "silent" stones because the pain is so very mild. It is always good policy to take a control roentgenogram of the kidney, ureter and bladder, when the pain is obscure and located in the back.

3. There is a renal condition called nephralgia which is little understood. This condition is baffling, as the most thorough studies possible and even exploratory operations with the opportunity of examining the kidney minutely fail to demonstrate any pathology. These patients complain of a constant ache in the region of the kidney, uninfluenced by posture. Rarely does the pain radiate. There is no ptosis and the urine is negative. The kidney may be sensitive to palpation or percussion. The pain probably arises in the renal sympathetics; either in the nerve endings in the capsule, or the ends along the renal artery. Decapsulation will relieve a large number of them. True renal sympathectomy, according to Papin, has not been accomplished so far, though a few have claimed to have done so.

4. Nephritis of certain types will give backache, namely, the acutely congested kidney, where the capsule is tight and under tension. Pain is full, tense, located in the costovertebral angles and does not radiate. It is constant and may produce nausea. It is almost immediately relieved by decapsulation. The urinalysis and functional tests will prove the disease present.

5. Certain drugs will produce pain in the kidney, as copaiba, turpentine, pennyroyal and cantharides. Usually there is the history of taking a drug. This pain is similar to that of the acutely congested kidney.

6. Trauma may also produce a renal pain. A blow over the small of the back may injure the renal sympathetics or cause a partial or complete tear of the organ. Again, blood clotting in the ureter causes a colic. The pain from trauma will depend upon the extent and location of the injury, with a few blood cells, marked hemorrhage, shock, nausea and vomiting. Often the pain is diffuse over the injured kidney. At times abdominal tenderness is present. There are so many other symptoms, as hematuria, marks of injury on the body, rapid pulse, low blood pressure and pallor, that the diagnosis of renal injury is not difficult. Intravenous urography is most valuable, if the patient is not in shock.

REDUCING VENEREAL DISEASE IN WASHINGTON, THE HOW

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Washington has no medical school or endowed clinics. Result: The county commissioners and health departments must care for the indigent sick, including venereals. The courts have decided that venereals can be forced to treatment or be locked up, and locked up even though under treatment, if evidence is at hand that they are likely to spread infection.

Recognizing the importance of food handlers being free from bacterial infections, long ago the departments of health were given the medical supervision of all such workers. In this state the food handlers' examination includes venereal disease, not necessarily because of the rather remote danger of syphilis or gonorrhea being conveyed thus, but as a sound method of reducing the incidence of the same. So far no diner has objected to his cook or waiter being prohibited from working because of harboring a venereal disease. It is a case of no work as a food handler so long as carrying venereal disease.

EXAMINATION OF FOOD HANDLERS

In Seattle, Yakima, Tacoma, Everett, Spokane, Vancouver and most of the lesser cities, food handlers, such as cooks, waitresses, candy girls, etc., both men and women, must be examined and passed by the health officer, which examination includes venereal disease. Where not otherwise provided for, the family physician is permitted to give this examination. Except in cities of the first class, having their own laboratories, the state laboratory examines all Widals, slides and blood Wassermanns.

When the state enforces a law relative to any disease, it must also furnish confirmatory diagnostic facilities to all. In 1929 the state laboratory did 17,840 Wassermann tests, and in 1930, 19,264; in 1929, 2,684 gonococcal slide examinations and in 1930, 3,235. In 1929 the City of Seattle laboratory did 17,525 Wassermann tests, and in 1930, 19,864. During 1929 this laboratory did 15,597 slide examinations for gonorrhea and in 1930, 19,000.

The report given the worker is not a health certificate. It merely gives the name, date, and states, "Having examined the above applicant, I hereby certify there is no danger from employment of said applicant in so far as this examination can cover." Signed (X. Y. Z., M.D.). The employer is liable to a fine for employing persons not thus certified by the health department.

In Seattle, all drivers of public conveyances, such as taxi men, bus drivers, etc., as well as all food handlers, must be examined at least once yearly. In this city all get the Wassermann test and slides for gonorrhea. Persons found diseased by these examinations are referred to their family physicians, unless they are unable to pay. Then they are referred to the public clinics.

Syphilitics under treatment are permitted to work. Many of them are treated merely because they must be, or lose their jobs. Gonorrheal sufferers are "just out of luck."

The effect of this Wassermannizing of Seattle food handlers, etc., is shown by the figures in table 1. The first series of 4042 tests shows a syphilitic incidence of 5.9 per cent, the second of 9194 tests an incidence of 3.8 per cent, and the third of 13,192 shows 2.9 per cent positive. That means a syphilitic decrease from 5.9 to 2.9 per cent. Syphilitic incidence in this class was cut in half in three and a half years. The positives either had to be treated or find other positions.

Table 1

Result of 26,408 Wassermann tests of all food handlers and drivers of public conveyances in Seattle from July, 1927 to January, 1931, three and a half years.

	Total Examined	Neg.	Pos.	Per Cent Pos.
First eight months	4,042	3,804	238	5.9
Following sixteen months	9,174	8,827	347	3.8
Next eighteen months to January, 1931	13,192	12,797	395	2.9
Totals	26,408	25,428	980	3.7

A fair idea of the syphilitic incidence among the general population can be had from the Wassermann figures of the Swedish Hospital, a Seattle institution caring for the average of society. See table 2. Their figures for 1920 to 1923 give a syphilitic incidence of 2 per cent and then from 1923 to 1927, 1.89 per cent.

Table 2

Syphilitic incidence in Swedish Hospital, Seattle.

ROUTINE WASSERMANN

	Total Examined	Positive	Per Cent
1920-1923	6,963	141	2.00
1923-1927	10,169	193	1.89

VENEREAL CLINICS

Seattle, having one-fourth of the state's population, maintains two up-to-date venereal clinics, the county hospital and city Health Department. Harborview Hospital, a county institution, handles gonorrhea, both male and female, in its outpatient urologic department. Syphilis is a separate clinic in the outpatient department, holding forth on days alternating with urology.

The Seattle female outpatient gonorrheal clinic is held three times weekly, supervised by a gynecologist who treats both outpatient and quarantine women. It is in the gonorrheal clinics that most of the syphilitic infectious stage is discovered.

The city male gonorrheal clinic is held the same time but entirely separate and cared for by an urologist. The syphilitic clinic for both sexes is held three times weekly, alternating with the gonorrheal.

At both places a social service worker first interviews all but quarantine cases, learning if they are at work, their earning ability, dependents, ability to pay, etc. The patient, if financially able, is told to consult a private physician, no particular man being specified, merely that he must be an M.D., not a cultist.

To avoid complete pauperization the patient at the city clinic pays a designated amount each visit. This, however, is most often deferred by the social worker.

In the city clinic the deputy commissioner of health examines any person running afoul of law who is suspected of having venereal disease. This includes in particular all moral offenders, prostitutes and pimps. Police case syphilitics, if previously reported as under the care of a physician, as the Washington law requires, are not held by the health department. If not reported even though treating, that person must remain in the internment hospital the same as though untreated.

Previously untreated syphilitics are held until rendered noninfectious, and then are referred to their private physicians or, if impecunious, to the city outpatient syphilitic clinic. These provisions make both doctor and patient careful about reporting, and continuing treatment.

Gonorrheally infected persons coming to the clinic with a police charge are held, whether under treatment or not. Gonorrhea can never be considered noninfectious, when associated with law breaking.

Some idea as to the health condition of these women can be had by referring to table 3. At least

Table 3

DISEASE INCIDENCE AMONG 1298 PROSTITUTES EXAMINED BY SEATTLE HEALTH DEPARTMENT, 1927 TO 1931

	Negative	Positive
From September, 1927 to January, 1930	510—54%	434—46%
From January, 1930, to January 1931	185—52.2	169—47.8
Total examined	695—53.6	603—46.4

Table 4

DISEASE INCIDENCE AMONG 1298 PROSTITUTES EXAMINED BY SEATTLE HEALTH DEPARTMENT, 1927 TO 1931

	Gonorrhea	Lues	Gonorrhea and Lues	Chancroid
From September 1927 to January, 1930	219—23.2 per cent	159—15.6 per cent	55—5.7 per cent	1—.1 per cent
From January, 1930 to January, 1931	107—30.2 per cent	47—13.2 per cent	14—3.9 per cent	1—.1 per cent
Total examined	326—25.1 per cent	206—16.0 per cent	69—5.2 per cent	2—.1 per cent

Table 5

CHANGE IN DISEASE INCIDENCE FROM 1917 TO 1931 AMONG SEATTLE PROSTITUTES

	No Disease Per Ct.	Diseased Per Ct.	Gon-orrhea Per Ct.	Lues Per Ct.	Gonorrhea and Lues Per Ct.
1917-1919	28.4	71.5	15	36.5	20.0
1927-1931	53.6	46.4	25	15.0	5.2

Table 6

FLEET FOLLOWERS; DISEASE INCIDENCE

Disease	Number	Per Cent
Gonorrhea	35	43.7
Syphilis	11	13.7
Gonorrhea and syphilis	4	5.
No disease	30	37.5
Total diseased	50	62.5
Total examined	80	

46.4 per cent are found venereally infected. The distribution by disease shows in table 4. This is quite an improvement over the 71.5 per cent found infected in war time, as shown in table 5.

A comparison as to the disease incidence among Seattle prostitutes and the imported ones was noticed when the Pacific Fleet was in Puget Sound. During that two weeks eighty "sea gulls," so named because of following the ships from place to place, were arrested and examined. See table 6 for details. These were all imported girls, carrying the high disease incidence of 62.5 per cent, as against the 46.4 per cent for the local girls.

DIVERGENT INTEREST SATISFIED

These venereal clinics have proven satisfactory to the department of health because the patients are both treated and educated regarding venereal disease. The public which pays the bill is satisfied, since only the poor and those girls of easy morals, who are likely to spread disease, are cared for. The indigents, wanting all they can get for nothing, are given the best of scientific care so they and their friends are satisfied. Since the county medical society controls the policies of the clinics, cooperation of the physicians is assured.

The City and Harborview Hospital clinics do not duplicate each other, since the hospital is to treat the sick and those happening to have venereal disease are treated as such. The City Clinic is for those in need of supervision, since the City Health Department is legally required to supervise infectious diseases and those likely to spread contagion.

REPORTING VENEREAL DISEASE

Washington laws require the reporting of venereal disease, first, by number, and if the patient quits treatment too soon, by name. It is then the duty of the health officer to see that the patient continues treatment either with the original doctor, or another of his own choosing, or if impecunious, at the public clinic. Thus the doctors soon learn that it is to the advantage of all concerned to report their venereals.

THE LAW PROHIBITS

The Washington law prohibits giving of certificates as to freedom for venereal disease. In reality, doctors feel that such certificates are recommendations for the girls. Health certificates in the hands of prostitutes are now passe.

In this state druggists are not legally permitted to diagnose, treat or even sell medicine as being recommended for venereal disease. Only an M.D. can do this. This law is rather unnecessary, though, since people no longer have such great confidence in the clerk's superior knowledge.

QUARANTINE HOSPITALS

The venereal quarantine hospitals are rehabilitating some of the younger girls before they become hardened. Many are rendered noninfectious. True, they care for just a fraction of the total number of prostitutes in the vicinity, but they do serve for the education of all. The girls locked up learn the necessity of treatment, methods of the same, and that when they are on the outside it pays to be treated if they wish to stay outside.

Commercialized vice is trying to eliminate disease for business reasons. Prostitution is no longer a police, but a health department problem. The prostitute wants to observe the laws of health insofar as her limited intelligence can comprehend.

SUMMARY

The law is on the side of reducing venereal disease. Public opinion is in sympathy with the enforcement of the law. The doctors know that it is to their advantage to observe the law.

Clinics that neither pauperize nor take patients from the doctors, and thus satisfy the majority of the people, are being conducted most successfully.

Result: Venereal disease is being brought into the open, forced to be under treatment and thus being considerably reduced. The statistics show it.

I wish to thank the following for their great assistance in collecting the material for this paper: Dr. A. E. Stuht, director, and Dr. A. U. Stimpson, chief epidemiologist, Department of Health, State of Washington, and Dr. E. T. Hanley, commissioner, and Dr. A. Weinzril, deputy commissioner of health, City of Seattle.

CHRONIC APPENDICITIS

IN THE EVERETT GENERAL HOSPITAL FOR 1930 *

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EVERETT, WASH.

There were thirty-one cases in the Everett General Hospital last year which were diagnosed chronic appendicitis and all but one had the appendix removed. There were thirteen males and eighteen females, ranging in age from fourteen to fifty. One-half of them were under twenty-five years of age.

There was not one complete history in the group. Pelvic examinations were recorded in four; in five cases there was no history unless five or six disjointed words could be termed such. In seven cases there was no history of appendicitis, the appendix having been removed during the course of another operation and subsequently found to be inflamed. The operative records were particularly unsatisfactory from an investigator's standpoint. There was no mention whether or no the mesenteric lymph glands had been palpated in the lower part of the ileum. Mesenteric lymphadenitis is one of the most common simulators of chronic appendicitis, Adami calling it subinfection. Barium pictures were taken, or at least the results recorded in three cases only.

There was no mention of any examination of any other interior abdominal structure. No surgeon noted that the cecum might be unduly mobile or sagging into the pelvis; no cecopexies were performed.

Many of the histories described a chronic pain that was always limited to the right iliac fossa with or without chronic tenderness. That such a pain is hardly ever due to chronic appendicitis was overlooked. The two common forms are, (1) occasional attacks of umbilical or supraumbilical pain occurring at rare intervals and often brought on by exercise, with rarely any nausea or vomiting, with tenderness over the appendix and perfect health between attacks; (2) cases with indirect symptoms, due to an adherent or obstructed appendix which interferes with the proper functioning of the intestinal tract, upsets peristalsis and causes a form of chronic intestinal indigestion.

There were only three histories that might bear a resemblance to these. Moynihan's "appendix dyspepsia" is characterized by pain coming on half an hour to an hour after eating, with no fixed interval of relief after a meal as in gastric ulcer; the pain is described as coming on "at any time" after a meal; it is worse on exertion and after exercise. Hertzler, after reviewing 2000 patients in his own practice with pain and tenderness in the region of the appendix, arrived at the conclusion that the fibrotic and other changes supposed to be indicative of chronic appendicitis are wholly inadequate to explain the symptoms ascribed to them.

There were no postoperative deaths or complications. Therein this differs from the mortality of acute appendicitis which remains almost as high as it was twenty years ago, chiefly because diagnosis in the fatal type has not improved. There is now strong evidence that the fatal cases of acute appendicular disease are primarily cases of obstruction and not inflammation of the appendix. The obstructive cases must be regarded and treated as belonging to the same category of urgency as internal strangulation of the intestine (Welkie of Edinburgh). There is an analagous type of chronic appendicular disease which is due to obstruction and this type warrants immediate surgery. Palmer says, with reference to chronic inflammation of the appendix, "the greatest steadying influence, acting as a check on a too great enthusiasm and leading to saneness of judgment, is the quiet, careful consideration of the postoperative records of patients upon whom operations have been made."

A curious and interesting statistical matter has been compiled in Russia anent the incidence of appendicitis. Since the Soviet regime has introduced semistarvation diets in the last decade, the occurrence has fallen remarkably, to less than ½ per cent.

These charts in the hospital are of little value in themselves, but they would be invaluable if the future progress of the patient was noted. However, thirty cases of chronic inflammation of the appendix in one year is not an unreasonable incidence in a hospital as large as this one.

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* Read before a Meeting of the Staff of Everett General Hospital, Everett, Wash., March, 1931.

IS INSULIN REDUCING DIABETIC MORTALITY?*

CONCLUSIONS FROM A STUDY OF DIABETIC DEATHS IN WASHINGTON IN 1929

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SEATTLE, WASH.

Insulin, made under license from the University of Toronto by Eli Lilly and Company, was first used during the experimental period on human diabetics during the spring and summer of 1922, and in the Pacific Northwest early in 1923. Over eight years have passed since that time, and the records of many diabetics are available as testimonials for or against the relief of suffering and the prolongation of life made possible by the use of insulin.

It has been repeatedly stated by practitioners other than doctors of medicine, in ignorance as well as with ulterior designs, that insulin has failed to accomplish for the diabetic what was expected during the infancy of its use. Many members of the regular profession have, through failure to become properly informed or because of personal experience from inaccurate use of insulin, let themselves become afflicted with a similar misconception. Although convinced by the evidence in their own practice of the great improvement in the condition of the diabetic made possible by the discovery of insulin, even those physicians who have given special attention to the care of diabetes have felt that the great diabetic family, treated of necessity mostly by the general profession, has not received the benefit in the way of decreased suffering and increased longevity that insulin should have brought about.

Best[1], codiscoverer of insulin, stated that: "In the Province of Ontario, Canada, where insulin has been supplied without charge to all indigent patients since 1923, the total distribution is approximately 56,300 units per day. This figure is based on the amount distributed in the year 1929. If an average daily dose of 15 units is assumed, 3,753 patients would be receiving the material. If we assume that 1 per cent of the population has diabetes, there are about 30,000 diabetics in the Province. There is no way of knowing the number of severe cases. A recent study of deaths from diabetes in the Province is interesting in this connection. In 200 deaths in the period of June, 1929, to February, 1930, in which diabetes mellitus is recorded by the physicians in answer to a special questionnaire as to the primary cause of death, in only forty-six cases had insulin been used at any time during the treatment, and only thirty-four were using it at the time of death." In other words, less than 25 per cent of the total number of diabetics dying used insulin at any time, and approximately only 17 per cent were using it at the time of death. From these data it would seem to be apparent that at least some cases which insulin might benefit are not receiving the material.

In an effort to throw some light on the probable reason for the too prevalent opinion that the prophecy of insulin had not been fulfilled, at least in this part of the United States, a study has been made by the writer of the diabetic deaths in Washington during 1929. A similar study has been made for Oregon by Dr. Blair Holcomb. Full appreciation is expressed of the hearty and interested cooperation afforded by the State Board of Health and by practically all of the profession of this state interrogated during this study.

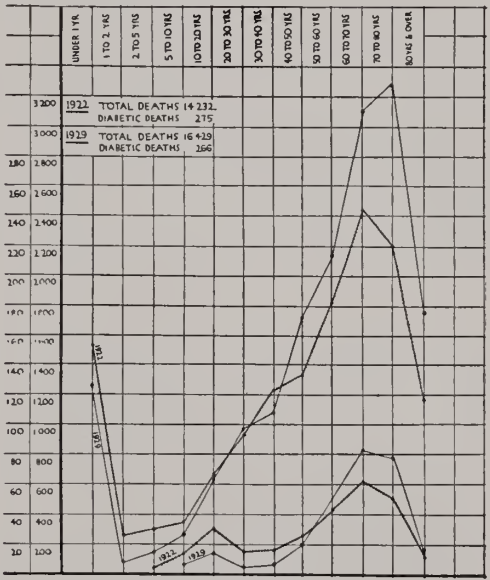

Fig. 1

Figure 1 shows a graphic curve of the total deaths and the diabetic deaths in 1922 and 1929. The number of diabetic deaths was lower in 1929, in spite of an increase in the total number of deaths. There were fewer deaths during the first five decades and a greater number after the fifth decade in 1929 than in 1922, the year before insulin came into use. From this it might be said that insulin enabled diabetics to live longer. The graphs of the total death rate show that the in-

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* Read before a Meeting of King County Medical Society, Seattle, Wash., May 11, 1931.

* From the Mason Clinic.

[1] Best, C. H.: Brief Review of Certain Physiological Properties of Insulin. Can. Med. Ass. Journ., 23:141-145, Aug., 1930. (Quoting from Defries and Ross in Can. Pub. Health Journ.).

CHART 1

USE OF INSULIN BY 226 PATIENTS WITH DIABETES. DIED IN WASHINGTON DURING 1929.

	Diabetes primary cause of death					Diabetes contributory cause of death				
Age groups	0-19	20-49	50-59	60-69	70+	0-19	20-49	50-59	60-69	70+
Insulin used regularly—										
good cooperation	3	2	4	11	4	2	3	2	6	7
poor cooperation	1	5	2	2	4	0	0	2	3	0
Occasionally	1	1	1	11	2	0	0	2	0	2
12 months before death	0	1	3	5	3	0	0	2	0	3
I week or less before death	5	4	5	4	7	0	1	5	1	2
Discontinued—										
with advice	3	2	2	1	4	0	0	0	2	1
without advice	0	3	1	1	4	0	1	0	2	0
Insulin not used—										
diet only	0	0	3	3	9	0	1	1	5	13
Refused insulin	1	3	5	9	17	0	1	1	1	2
No record of use	2	2	1	9	7	0	0	3	4	2
Total in age groups	16	23	27	56	61	2	7	18	24	32
Total	183					83				
Used insulin some time	111					49				
Did not use insulin	50					25				
No record of use	21					9				

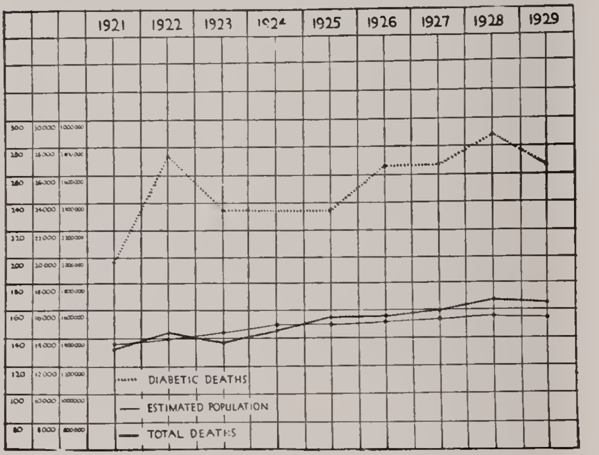

Fig. 2

crease in 1929, compared to 1922, occurred chiefly among individuals after the fifth decade, possibly indicating a tendency to a longer span of life, but probably due to the fact that our increasing population is to a considerable extent due to immigration of persons past middle life.

Figure 2 shows three graphs, representing the total diabetic deaths, total deaths from all causes, and the estimated population from 1921 to 1929 inclusive. Although the curves of estimated population and of total deaths follow each other closely, are even and show a gradual rise, the curve of the diabetic deaths shows a sharp decline for the years 1923, 1924 and 1925, with a gradual rise to a mean for the years 1926 to 1929 inclusive. This may be interpreted as meaning that diabetics who might have died in 1923 to 1925 lived, through the use of insulin, for a period of at least several years longer.

Copies of 266 death certificates, on which diabetes was mentioned as a primary or contributing cause of death, were obtained from the State Board of Health. A questionnaire was sent to the physician who signed each of these certificates. If he was not able to supply the information, request was made of the informant mentioned by name on the certificate. The data here presented were compiled from 236 replies, although a few more than this number were received later. Of the total 266, 108 were males and 158 were females.

Chart 1 (form used by Defries and Ross purposely followed) shows the group divided into those cases where diabetes was a primary and where it was a secondary cause of death. The group of primary cases, 183 in number, is of most interest. Only twenty-four patients used insulin regularly with good and fourteen with poor cooperation. There were sixteen who used insulin occasionally. There were twelve who took it less than two months before death and twenty-five who delayed until less than seven days before the end.

Twelve patients discontinued insulin after using it six months or longer, apparently with at least the tacit permission of the physician, and nine discontinued its use, although advised against doing so. Thirty-five patients refused to use insulin, but seventeen of these were past 70 years of age. In twenty-one instances no information could be obtained regarding its use.

Of the total group, 68 per cent used insulin at some time during the course of the disease and 53 per cent used it in the final illness, although but 22 per cent delayed its use until the final illness.

There were thirty-two patients in the total group, including all cases regardless of diabetes being a primary or coincidental cause of death, who used insulin six months or longer but not in the final illness. Twenty-one of these were between 60 and 75 years of age. Five were under 50 years of age and three were over 75. One took up a cult, four refused to use it longer, and five consulted no one regarding the discontinuance. Apparently twenty were permitted to discontinue the use of insulin by their physicians. Five of this group died in coma, three with gangrene, four with sudden fatal circulatory accidents, and one took up christian science.

Fifty-one patients did not use insulin until the final illness. Eleven refused to use it previously, and of these three died in coma and three with gangrene. In thirty of the fifty-one patients, sugar was not discovered until the final illness. This constitutes an argument for periodic health examinations. Eight of these died in coma and twelve with gangrene, possibly mostly preventable.

Seventy-five patients never used insulin at any time. Forty of these refused. Four who refused were christian scientists and eleven were over 75 years of age. Seven died in coma and five with gangrene. Thirty-five of those who never used insulin did not refuse. In seven of these the physician considered death inevitable and in eighteen he considered insulin unnecessary. In two instances medical attendance was very brief and three patients suffered sudden death.

Forty-eight certificates were signed "diabetic coma." Probably not nearly all of these cases were coma purely of a diabetic type. Twenty-four of these patients received insulin, fifteen did not, and in nine instances no information was obtainable. Of the twenty-four who received insulin and yet for whom the death certificate gave coma as the cause of death, nine were under the care of the physician one day or less. Fifteen were under the care of a physician thirty days or longer, and in nine instances, where the age was less than 60 years, possibly other causes of death were present. Of the fifteen patients who did not receive insulin and whose death certificates were signed "diabetic coma," seven refused to use it, two were seen a few hours before death, and three were christian scientists.

The cardiovascular-renal complications mentioned on the certificates are interesting and impressive. Of a total of 115, eight patients were under 50 and 107 were over 50 years of age. Twenty-one suffered a cerebral accident. Thirty-three suffered a cardiac complication and nineteen a renal complication, while in thirty-eight instances gangrene was present at death.

Data which are not a part of the present study but which bear a relationship to it are as follows: In a series of approximately 600 diabetic patients, follow-up studies in January, 1921, showed that the average duration of life of those living who use insulin is 7.2 years, and that the average duration of life of a smaller group who do not use it (obviously the milder cases) is 6.1 years. Of those dead in the same series, those who used insulin lived an average of 5.4 years and those who did not use it lived an average of 6.1 years. These latter cases were obviously the milder and the uncomplicated cases. In fact, death was considered inevitable, regardless of diabetes, in 85 per cent of the group who used insulin but in only 40 per cent of the group who did not use it. In this group, in all probability duration of life would have been even greater in many instances with the help of insulin.

SUMMARY AND CONCLUSIONS

From the above statistics and from impressions obtained from reading the replies to the questionnaires, it has seemed to the writer that the following summary and conclusions are justified:

1. Two of every three diabetics, who died in the state of Washington during the year of 1929, used insulin at some time during the course of their disease. Although many of these cases used insulin for only a short period, this is a considerably higher percentage than that shown by the statistics for Ontario.

2. Only one of every two diabetics who died in the state of Washington during the year 1929 used insulin during the final illness.

3. The necessity of impressing upon the public mind, through propaganda similar to that employed in connection with cancer in recent years, of the great need for early diagnosis is indicated by the considerable number of cases where sugar was first found in the final illness.

4. The profession must be educated to believe and to practice upon their diabetic patients the following axioms of modern diabetic therapeutics:

a. Diets accurate from a diabetic and a nutritional standpoint are vital, if insulin is to produce maximum results among this group of patients.

b. A haphazard diet with a random dosage of insulin may produce apparent physical improvement and a sense of well-being, but only continuously sugar-free urine and normal blood sugar concentration will prolong the life of diabetics and prevent or defer complications which cause death.

c. Joslin's law holds and receives repeated confirmation as time passes, i.e., that the longer a diabetic lives, if he controls the diabetes the milder the disease becomes, or, in other words, that tolerance is built up and the disease tends to become cured; and the converse that the longer a diabetic lives if not controlled—as evidenced by glycosuria and hyperglycemia—the more severe does the disease become.

d. Diabetic coma, or even severe acidosis, is an emergency and almost always requires hospitalization if treatment is to be successful. When the public believes this as they believe what they do regarding acute appendicitis, deaths from diabetic coma will disappear. Early treatment is essential. The patient with acute appendicitis, even though treated by a skilled surgeon, will often die whon operated on too long after the onset, and the diabetic coma will frequently be lost by even the most skilled internist when even ideal therapeutic measures are instituted too late.

e. The proper treatment of diabetic gangrene requires as great judgment, experience and skill as does any condition in the field of medicine and surgery. It is a joint problem of the skilled internist and surgeon. When complicated by infection, diabetic gangrene always has a high mortality, but many diabetics are alive and happy today after having successfully passed through bilateral amputations.

f. Incision and drainage or removal of infected tissue is many times as urgent in the diabetic as in the nondiabetic individual.

5. The failure of a thorough belief and a proper preachment of the above principles of correct diabetic care on the part of the medical profession is manifest from these data.

6. In spite of this, this study tends to prove that insulin has increased the span of existence for the diabetic and has decreased diabetic mortality. If this change has not been as great as it seems it should have been, it is because in the vast majority of instances the treatment of the diabetic has consisted of the administration of insulin with almost utter disregard for the other important essentials of an adequate diabetic regime. The failure lies not in insulin but in our use of it.

HEART BEAT AND RESPIRATION IN TOTAL NOVOCAINE ANALGESIA

George R. Vehrs, M.D.
SALEM, ORE.

Part II

(Concluded)

This article was written after a great deal of experimentation on animals to determine if possible the amount of novocaine which, when present in the brain stem, will permit of major operative procedures without block of the vital motor nerves and centers, and give an unaltered cardiac and respiratory rhythm, together with safety factors necessary to life.

In December, 1929, experiments were performed under pure spinal novocaine analgesia, followed by operative procedures on the cord and medulla to see if direct application and injection in the parenchymal cells caused death. Of course death occurred only where vital centers were blocked directly. Then in 1930, under total novocaine spinal analgesia, the heart was exposed through a costochondral flap, and moving pictures were made to register the cardiac and respiratory rates and rhythms. Subsequently cisterna magna analgesia was substituted to measure the initial injection, to get the rate of dilution and diffusion, and to determine the safe operative dose, the alarming dose and the lethal dose, together with the causes of death.

ANATOMY

The anatomy[7] in total analgesia is of prime import, as here we are dealing with three systems of nerve structure: The cord, the medulla and pons, and the brain proper. In the spinal cord the nerve cell centers are surrounded by the nerve axones or tracts which go to make up the nerve roots found in the arachnoid of the cord (fig. 8).

In the brain stem, or pons and medulla, this arrangement is different, inasmuch as the nerves, axones and roots, as well as the nerve centers, are exposed directly to cerebral fluid of the cisterna magna and fourth ventricle (fig. 9).

In the brain proper the nerve tracts are surrounded by nerve centers and here they are directly exposed to the anesthetic action of drugs in the cerebral arachnoid, while the nerve axones are quite well protected (fig. 10).

This description will visualize differences in anatomic structures exposed to subarachnoid novocaine solution, and also point the way to differences in effects of such exposure. For example,

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[7] Spalteholz, Werner: Hand Atlas of Human Anatomy. Exhibits 1, 2, 3, and 8.

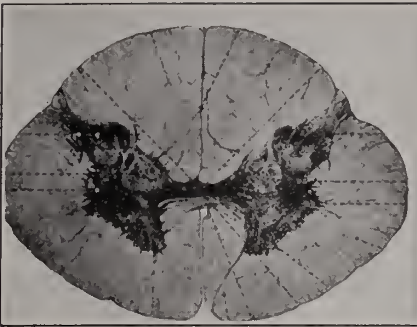

Fig. 8. a

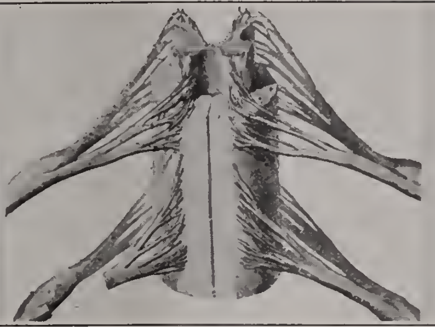

Fig. 8. b

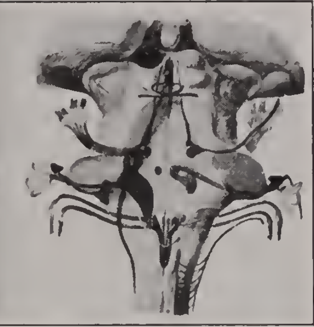

Fig. 9

Fig. 8. a, Cross section of the spinal cord, showing the central gray cellular matter surrounded by the axones. b, Cross section of cord, depicting the nerve roots which traverse the arachnoid and which in spinal analgesia are bathed in novocaine solution.

Fig. 9. Brain stem with the roof of the fourth ventricle removed to visualize the nerve centers of the medulla and the nerve roots traversing the cisternal arachnoid and which in total analgesia are bathed in novocaine solution.

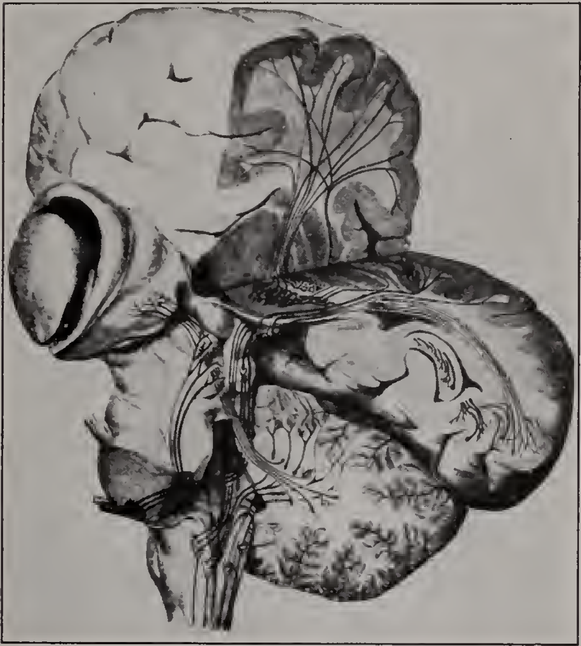

Fig. 10. Section of the brain, showing that the nerve axones are inside and well covered with gray cellular matter in both cerebrum and cerebellum.

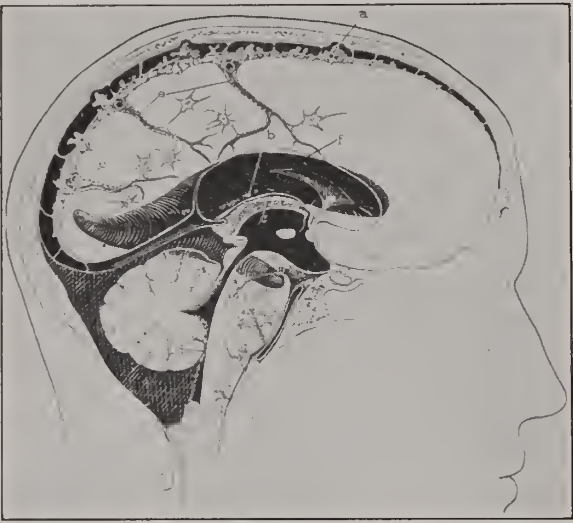

Fig. 11. Composite drawing of transparent brain. a, Pacchionean villi in longitudinal sinus. b, c, d, Choroid plexuses in lateral, third and fourth ventricles. e, His and Robin perivascular and pericellular arachnoid spaces leading into peripheral arachnoid. f, Limiting ventricular apendymal lining. g, Central canal of the cord emptying into the fourth ventricle. m, Foramina of Luschka between the fourth ventricle and the cisterna magna. i, Cisterna magna.

spinal anesthesia is mainly nerve root block; brain stem novocaine anesthesia is nerve root and center block, while arachnoid cerebral novocaine anesthesia is cerebral nerve center black. We must picture the various procedures in segmental or regional block, and recognize the differences which follow in anesthesia of the three segments mentioned.

The only important segment is the brain stem and the upper cervical region, as it is this part of the nerve system which contains the vital heart, vasomotor and respiratory systems. Therefore, we look to the anatomy of the medulla and upper cord in order to discover the endowments of nature which will permit total analgesia and at the same time produce no motor nerve block.

The cerebrospinal arachnoid circulation consists of two connecting systems which are dependent upon each other for the origin, chemistry, flow and exit of the fluid therein contained. The inner or ventricular system consists of the ventricles, aqueduct of Sylvius and the central canal of the cord. The outer system is made of an arachnoid space between the dura and the pia which surrounds the entire brain and cord substances, together with the arachnoid spaces described by His and Robin, which consists of arachnoid channels around each artery, arteriole and capillary, permeating the brain and cord parenchyma, and communicating with the perineural and pericellular spaces.[8] Joining these two systems are the foramina of Luschka and Magendie in the roof of the fourth ventricle. No other openings have been described, but some authors are of the opinion that very minute stomata may exist. Others claim that there are no communications at all, not even the foramina of Luschka and Magendie[9] (fig. 11).

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[8] Weed, L. H.: Studies on Cerebrospinal Fluid. Jour. Phys., Vol. 48, 1914-1916.

The cerebral fluid is important, inasmuch as its presence is due to secretion by the choroid plexus and ependymal cells, to osmosis, dialysis, transudation, filtration and diffusion. I believe the concensus of opinion is that it is of multiple and mixed origin.[10] It is excreted through the pacchionian villi and granulations into the venous sinuses.

It is alkaline with a highly protected alkali reserve, high sugar, sodium and potassium content. It flows under the high pressure of 103 mm. of mercury in the ventricles toward the cortex through the arachnoid spaces which have a pressure of 82 mm. of mercury, and bathes each nerve cell with a nutritive alkaline fluid, thus aiding the capillaries to nourish the individual nerve element. The pulsations of the arteries, veins and sinuses cause an ebb and flow in the brain fluids, thus assisting the diffusion of its colloid and crystalloid contents.

The functions of this circulatory system are many:

1. Acts as a cushion for the protection of the delicate structures of the brain and cord.
2. Carries nutrition and salts to the cells.
3. Carries the products of catabolism to the cortex for excretion.
4. Dilutes poisons generated from within or introduced from without.
5. Carries antibodies to infected areas when diseased.
6. Permits medication of brain cells in treatment of pathologic conditions.
7. Permits arachnoid anesthesia.
8. Prevents nerve cell shock by preserving a high alkali reserve.
9. Excretes foreign products rapidly.
10. Protects the vital motor centers from paralysis by rapid dilution and diffusion of drugs through the arteriovenous pulsations, and by supplying the cells with sugar, salts and alkalis.

PHYSIOLOGY OF NOVOCAINE IN THE BRAIN STEM

Anesthesia of the brain stem through the cisterna magna brings into play certain factors which are not present in spinal anesthesia. Here we have a large cistern, communicating with the entire arachnoid system, which is continuous around and throughout the brain and cord, and communicates through the foramina of Luschka and Magendie with the fourth ventricle. We have a pressure of around 82 m. of hg., and nerve centers which have been described as especially protected against anesthesia by a plentiful cerebrospinal arteriovenous circulation, which produces a pulsating cerebrospinal fluid, are bathed in stimulating salts, sugar and a high alkali reserve. We hereby have a hydraulic pulsating method which washes out anesthetics and other chemicals that are in an unstable physiochemical union with the lipoids of the vital cardiac and respiratory nerves and centers, and which causes a rapid dilution, diffusion and absorption, thereby permitting semicrippled vital motor nerves and centers to recover rapidly and to function normally.

Block of the sensory and motor cranial nerves and centers are directly proportional to (1) the concentration and volume of novocaine injected, (2) the pressure in the arachnoid, (3) the speed of diffusion, (4) the lipoid content of cells and axones.

The rate of fixation varies according to the pressure which drives the novocaine into the lipoids of the nerve cells and axones.

In total analgesia by the spinal route novocaine is fed into the cisterna magna in a constant and regular stream according to the diffusion and dilution rate. This dose of novocaine must be of sufficient size to produce analgesia and not large enough to cause paralysis of the vital motor nerves.

DIFFUSION OF NOVOCAINE IN THE ARACHNOID FLUID

1. Diffusion of a crystalloid in an aqueous solvent progresses at a definite rate until its concentration is uniform throughout the solvent.
2. Gravity favors diffusion.
3. Where pressure is changeable and where a pulsating mechanism is present, the constant agitation will increase the rate of diffusion.
4. The mechanical change in pressure, due to lowered arterial and raised venous pressure, increases the speed of diffusion.

DILUTION OF NOVOCAINE SOLUTIONS

1. The dilution depends on the rate of excretion by veins and excretory cells.
2. It is directly proportional to the rate of diffusion.
3. Fixation by lipoids causes a considerable dilution of the arachnoid fluid.

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[9] Magendie, F.: Rech. Physiol, et clin, sur le liquide cephalorachidien, Paris, 1842.

[10] Riquier, C. C. and Ferraro, A.: Circulation of Cerebrospinal Fluid from Standpoint of Intraventricular and Intraspinal Therapy. J. Nerv. and Ment. Dis., 64: 561-580. Dec., 1926.

Kilograms body weight	Am't of novocaine injected	or of neocain	Sensory block	Motor block	Respiration	Cardiac action	Life
22.50	per cent 15 cc. of 12	per cent	Yes	Yes	None	About 4′ irreg. and fast	Dead
25.60	6 cc. of 6		Yes	Yes	None	About 4½′	Dead
9.00		3 cc. of 9	Yes	Yes	None	3′	Dead
10.00	6 cc. of 3		Yes	Raised up on feet	Altered	Fast and irreg.	Fell dead
10.24	6 cc. of 3		Yes	Raised head	Good 4′	Fast 8′	Dead
37.50		3 cc. of 6	Yes	None	Altered	Fast and irreg.	Life*
Added		2 cc. of 6	Yes	Yes	None	Few minutes	Dead
6.00		2½ cc. of 3	Yes	Could move	Good	Normal	Life*
5.00		3 cc. of 3	Yes	None	Good	Fast, then normal	Life*
7.50		1½ cc. of 6	Yes	No	Altered	Fast, irreg., then good	Life*
10.00	1 cc. of 3		Yes	Could move	Good	Good	Life*
8.00	1.75 cc. of 6		Yes	No	Altered, then normal	Irreg., then good	Life*

Fib. 12. Some experiments on animals to prove the lethal, as well as the safe doses of novocaine, when injected directly in the cysterna magna.

* Cysterna magna injections show there is a sensory block, and in safe dosage little or no motor block. Also that alarming doses cause changes in the heart and respiration, and in these the animal does not move except to breathe because of greater motor block.

4. The amount of diffusion of novocaine in the ventricular and arachnoid fluid is sufficiently rapid to cause the final dilution to be noneffective for analgesia and nerve block.

RULES FOR TOTAL ANALGESIA BY NOVOCAINE IN EXPERIMENTS ON ANIMALS

Only novocaine to be used. Injections to be introduced into cisterna magna. Trendelenberg positions to be used during injection of cisternal type.

INFORMATION DESIRED

1. What is the safe dose of novocaine in the brain stem?

2. What dose of novocaine in the cisterna magna is alarming in regard to vital function?

3. What dose will completely paralyze the heart and respiratory nerves?

I wish to give you the work on animals which is now complete, and which will depict the relationship of results obtained in total analgesia through the lumbar route and in direct cisterna magna analgesia. These experiments were made to establish in the surgeon's mind that there is a safe cisternal dose of novocaine, giving good respiration and good heart action,[11] and that death by novocaine comes either from brain stem anemia[12] with respiratory failure by paralysis of respiratory nerves and centers, or from heart failure due to cardiac anemia.[13]

By injecting various doses of novocaine in the cisterna magna of animals we found that there was a mean dose in the arachnoid system of the brain stem which is safe as regards heart action, respiration and life. There must be an initial fixation dose for sensory block, followed by the presence of enough novocaine to continue this analgesia. Three-tenths per cent and under gave insufficient sensory nerve block, and 3.33 diluted down to .56 per cent in two minutes gave a sufficient novocaine concentration and fixation time for about thirty minutes of sensory anesthesia, with no motor block.

The following records will give an idea of how much novocaine introduced into the cisterna magna in a slow, regular manner is fatal, or causes alarming symptoms, or is safe for analgesia. It will also show that the rapid diffusion gives the range of safety spoken of as the mean safety dose (fig. 12). In total spinal analgesia this mean dose is constantly diffused into the cisterna magna and continues analgesia of the brain stem according to the size of the initial dose. In cisternal analgesia renewal doses are necessary to accomplish the same result.

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[11] Vehrs, G. R.: Heart Beat and Respiration in Total Novocaine Analgesia. North. Med., 30:256-260. June, 1931.

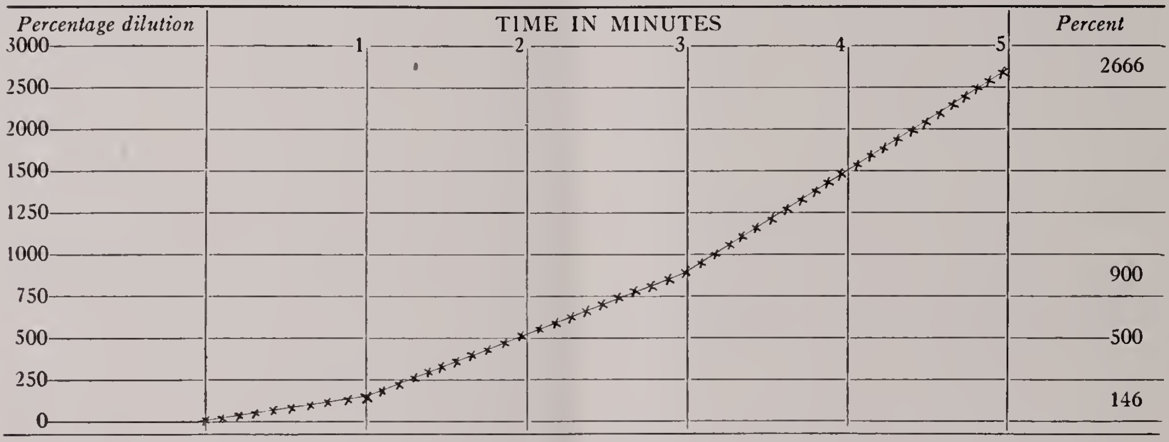
[12] Koster, H.: Spinal Anesthesia with Special Reference to its Use in Surgery of Head, Neck and Thorax. Am. Jour. Surg., 5:554-570, Dec., 1928.

[13] Koster, H. and Kasman, L. P.: Spinal Anesthesia for Head, Neck and Thorax; its Relation to Respiratory Paralysis. S. G. O., 49:617-630, Nov., 1929.

Weight of dog in kilograms	*Novocaine injected*		*Cisternal diffusion time, minutes*	*cc of cisternal fluid withdrawn*	*Novocaine content in mg.*	*Novocaine in this fluid percent*	*Dilution of Novocaine*	*Percentage diffusion rate*	*Heart and respiration*
	cc. of	*per cent*							
20.480	2	3.33	1	2.6	64	2.46	1–40	33	Good
10.240	1.5	3.33	1	.75	10.05	1.34	1–74	146	Good
10.240	1.5	3.33	1	.9	12.42	1.38	1–72	140	Good
7.680	1	3.33	1	.4	5.28	1.32	1–75	150	Good
30.720	1.5	3.33	1	2.4	31.92	1.33	1–75	150	Good
12.800	2	3.33	1¼	2.	16.20	.81	1–123	310	Good
30.720	1.5	3.33	2	2.45	13.72	.56	1–180	500	Good
25.600	1	3.33	2	.9	4.77	.53	1–160	433	Good
15.360	1½	3.33	2¼	2.2	10.30	.46	1–210	600	Good
10.240	1.5	3.33	3	.7	2.38	.34	1–300	900	Good
30.720	1.5	3.33	3	2.2	6.82	.31	1–320	966	Good
30.720	1.5	3.33	5	2.4	2.88	.12	1–830	2666	Good

Fig 13. Results of experiments on animals using novocaine in direct cisterna magna analgesia.

In cisterna magna subarachnoid analgesia the rate of diffusion and dilution are very rapid. For example: cord dilution, 1-5 or 1-7 in ten minutes; Cisterna magna dilution, 1-27 in five minutes.



1-30 dilution used, or 3.33 percent.

This graph represents the rate of diffusion and percentage dilution which occur in the various intervals between introduction into and aspiration from the cisterna magna of novocaine solution in the preceding experiments.

The actual results of cisterna magna analgesia could only be surmised in the preceding experiments. Following this many additional experiments were made, but only those which are important and bear on this subject will be included.

After introduction of given amounts of novocaine solution in the cisterna magna, aspiration was performed at varying intervals, namely ½ minute, 1 minute, 1¼ minutes, 2, 3, and 5 minutes. In order that experimental accuracy be maintained, many animals were injected and aspirated. Great difficulties were encountered and many failures followed before good results were obtained. The aspirated cerebrospinal fluids were properly preserved, sealed and quantitively tested with the following results (fig. 13).

I found that there is a definite relationship between total high spinal anesthesia by second lumbar injection, and cisternal anesthesia of the brain stem. I found that anesthesia of the nervous system in segments gave entirely different results on account of the locations of vital centers and their anatomic, physiologic and chemical differences. By injecting .075 gm. novocaine in the lumbar arachnoid, we may get analgesia of the saddle type, for instance, without motor nerve block, as evidenced by muscular movements of the extremities and by complete block of pain. Higher concentrations of

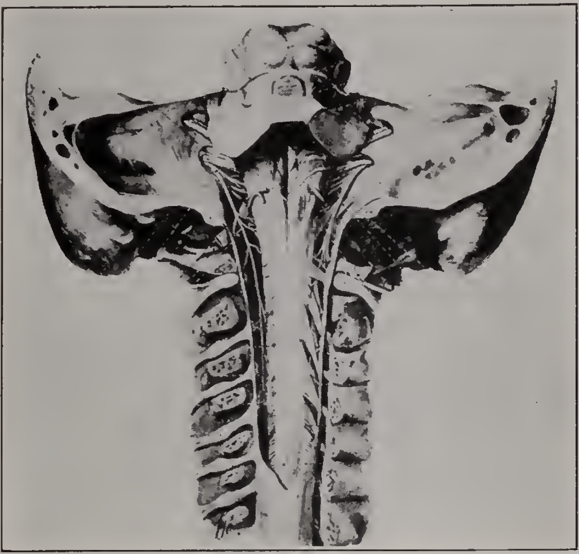


Fig. 14. Roof of the brain stem removed to show the phrenic and motor cranial nerves within the arachnoid, which in high or total analgesia are blocked by using too great a concentration of novocaine.

novocaine, e.g., 100 mg., in 1 or ½ cc. injected into the same region will give motor and sensory block. Thus we see that .025 mg. of novocaine in addition to sensory analgesia will block the motor cells and axones of the lower cord. This same rule applies throughout the cord under the same conditions of arteriovenous circulation, spinal fluid pressure, concentrations, diffusion, dilution and novocaine fixation.

The small volume, high concentration technic of Tuffier, and used by Labot[14] is no doubt the best technic for pure novocaine analgesia, when injected into the lumbar arachnoid. In this type the reservoir of the lumber arachnoid, holding the small volume of high concentration of novocaine or other anesthetic drug, slowly feeds into the upper arachnoid by diffusion, giving a weaker solution as it diffuses upwards into the cisterna magna, but offering the cisterna a continuous stream of novocaine for analgesia of the sensory, cranial and upper cervical nerves. This stream is sufficiently diluted by the large amount of fluid that there is no block of the upper cervical and cranial vital motor nerves (fig. 14).

In the homogenous large volume lower concentration technic of Delmas,[15] large quantities of, say 12 cc., of spinal fluid are injected with a concentration of novocaine varying from three to five per cent. These high concentrations of 300 mg. of novocaine in 12 cc., or three per cent, will surround the respiratory nerves and cause motor block, and then enter the cisterna magna and block the motor nerves here also. This and greater doses will cause many deaths. Pitkin's measurements of the spinal dura are very accurate, but were only reported to the level of the sixth dorsal vertebrae.[16]

Recently I have operated (postmortem) upon an average sized man of 160 pounds and found that the arachnoid spaces of the cord held 16 cc. to the sixth cervical vertebrae. It will not be presuming too much to say that the arachnoid of the average adult cord will hold around 20 cc. of spinal fluid. Upon these measurements the percentages of novocaine that feed into the cisterna magna can be quite accurately gauged in a given injection technic, using small amounts of high concentration and the Trendelenberg position.

Six cc. of .250 mg. of novocaine, or 4.16 per cent, will dilute down in 20 cc. to 1.25 per cent. Figuring .75 per cent for fixation in nerves and absorption into the venous system, it leaves about .5 per cent, bathing the upper cervical nerves and pouring into the cisterna magna. Practical experiences have proven this method safe in the hands of experienced surgeons and anesthetists.

In one dog I renewed the dose of 1½ cc. of 3.33 per cent novocaine solution three times, and each time the dog went to sleep and was well prepared for operative surgery for about thirty minutes. This dog recovered from these renewal doses and was able to walk about the operating room.

In cisternal analgesia with no motor block, the entire head and neck, shoulders and front legs were insensitive to pain and the animal could walk. In a few cases of doses which cause alarming symptoms of respiratory embarassment, the dog was asleep and there were no motor movements until the motor nerves again regained conductivity.

In this type of regional anesthesia the parasympathetic nerves of the eye, heart, brain and intestines are blocked, which gives the opposite results as compared to spinal, e.g., a loss of eye reflex, a rapid heart, dilated intestines and contracted visceral blood vessels (fig. 15). In spinal we have a slow heart, no loss of eye reflex, contracted intestines and dilated blood vessels (fig. 16).

Jonnesco's[17] regional analgesia, in which there is cisternal sensory nerve block, bears out these experiments as well as giving the fixation time for co-

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[14] Labot, G.: Regional Anesthesia. Its Technic and Clinical Application. W. B. Saunders Co., Phiadelphia, 1928.

[15] Delmas, P.: General Laws for Intraspinal Anesthesia., Presse Med., 28:596. Aug. 28, 1920.

[16] Pitkin, G. P.: Controllable Spinal Anesthesia. J. Surg., 5:537-553. Dec., 1928.

[17] Jonnesco, T.: Remarks on General Spinal Analgesia. Brit. M. J., 2:1396-1401. Nov. 13, 1909.

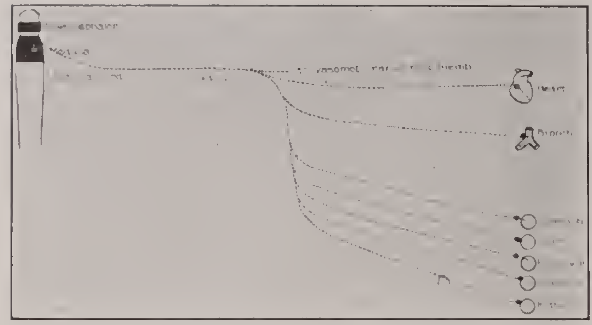

Fig. 15. In cisternal analgesia the parasympathetic nerves are bathed in novocaine solution as well as the cranial nerves.

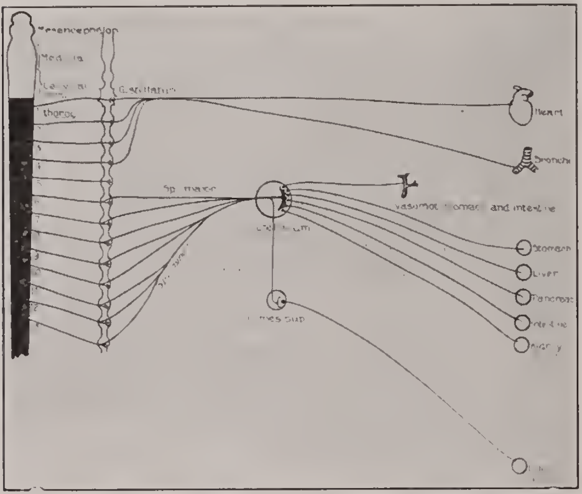

Fig. 16. In spinal analgesia the sympathetic rami are bathed in novocaine solution as well as the spinal nerves.

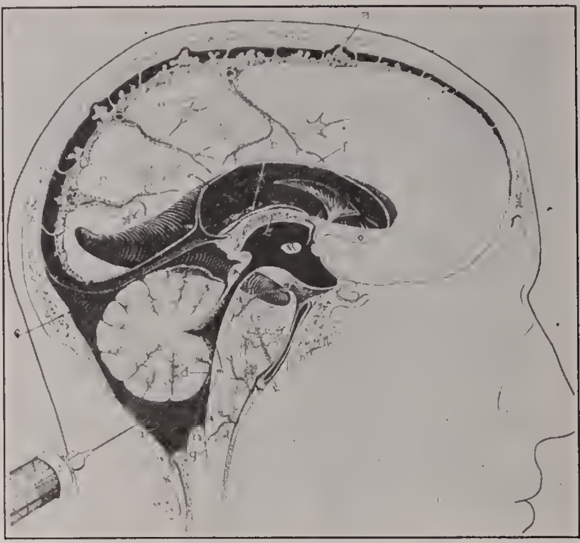

Fig. 17. Composite drawing of the transparent brain, visualizing the cerebropsinal fluid circulation and the important anatomy.

1. The inner system consists of: n, Lateral ventricles. r, Third ventricle. s, Aqueduct of Sylvius. m, Fourth ventricle. g, Central canal of the cord. b, c, d, The secreting choroid plexuses.

2. The outer arachnoid system consists of: a, Pacchionian villi. e, Intramural perivascular arachnoid tubes emptying into the general arachnoid of the brain and cord. k, Arachnoid of cord continued upwards into the cisterna magna. i and p, Cisterna magna and basilas. j, Aspiration of cisternal fluid and reinjection of anesthetic. l, The larger basilar artery which supplies the pons and medulla. o, Corpus callosum.

caine derivitives on sensory nerves. McGavin's[18] report of Jonnesco's operation at the Seaman's Hospital, Greenwich, November 18, 1909, is as follows:

A man, aged 32, of strong physique, suffering from a mass of tuberculous glands in the submaxillary region. The injection, which consisted of stovaine 3 cc. and neutral strychnine sulphate ½ mg., was made between the second and third dorsal spines in the median line, the patient being in the sitting position and with the head fully flexed on the neck. At the end of two minutes he was placed gently on his back, and the head and shoulders were lowered. Analgesia was complete in about one minute to the level of the forehead, when the table was levelled and the operation commenced.

The glands were removed without any pain whatever, but deep tactile sensation was retained. Both costal and diaphragmatic respiration were carried on perfectly normally. The conjunctival reflex was partially abolished and the tongue was insensitive, although the patient could speak fairly well. Hearing was not interfered with. The analgesia extended to the region of the umbilicus, and lasted about an hour. He walked without difficulty from the theatre to the ward. He stated the following day that he had "felt no pain whatever, and only knew that something was being done, by the movement of his head and the pulling at his neck." He said he "would not mind undergoing it again."

We have distinguished between sensory nerve block (analgesia) and motor block, because in much of the work on total novocaine analgesia there is no head and neck motor nerve block. This one factor is of great importance because it demonstrates sensory nerve block occurs the same in brain stem analgesia as in spinal, and that larger doses of novocaine will block motor conduction. The only difference we could find in the higher vital centers and nerves, as compared to the common lower centers and nerves, was that the brain stem has a better and more active blood supply, a greater amount of cerebral fluid to diffuse into and a fluid richer in the stimulating salts of potassium and sodium, in high alkali reserve and sugar content. The vital nerve centers have a special endowment, whereby they are stimulated to function by the varying amounts of oxygen and carbon dioxide present in the blood stream and these centers are automatic in the production and relaying of stimuli. This metabolic activity, together with the rapid venous absorption of the cell, the rapid washing out of the unstable novocaine by the pulsating flow of cerebral fluid, and the fact that the ventricular flow is towards the arachnoid system, preserve and protect the functional integrity of these vital nerves and center (fig. 17).

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[18] McGavin, L.: Spinal Anesthesia. Brit. Med. Jour., 1:1459-1909.

The cerebral fluid of the cisterna magna, draining as it does the cisterna points anteriorly, the cisterna basalis above and the sylvian cisternae laterally, represents a large lake, into which the ventricular fluid and the arachnoid spinal fluid empty. This large lake, situated as it is behind the fourth ventricle and medulla and engulfing most of the cranial nerves, is the keystone of safety against vital nerve block by anesthetic drugs which enter it either through spinal or by cisternal injections.

SUMMARY AND CONCLUSIONS

1. Possibly the greatest protection of the vital motor centers of the medulla against novocaine nerve block is due to the presence of a large amount of cisternal and ventricular cerebral fluid, as evidenced by the rapid diffusion and dilution in the experiments.

2. The vital motor centers are anatomically, physiologically and chemically well protected as compared to nonvital motor centers of the cord.

3. Because of the differences in the arteriovenous and arachnoid systems of the cord and brain, it is harder to block and to continue the block of the vital motor centers.

4. The vital centers of the brain stem can withstand reasonable doses of novocaine but will also be paralyzed rapidly, if the same high concentrations which are introduced in the spinal arachnoid are injected directly into the cisterna magna, as proved in experiments.

5. Anesthesia in block of various centers of the brain is followed by symptoms according to the function of the region involved. For example, cortical block of the sensory area not involving the medulla will give only loss of sensations. Caudal spinal block will not lower blood pressure, but subdiaphragmatic block will cause much lowering of it. Total anesthesia of the body gives very little additional vasamotor paralysis as compared to subdiaphragmatic block, because practically all the vasomotor nerves are blocked in the latter.

6. The initial amount of novocaine by cisternal block must be higher to produce total analgesia than that which diffuses into it during total spinal analgesia, since the lower centers are not blocked and muscles are not paralyzed in safe cisternal analgesia.

7. The Trendelenberg position must be used in this work.

8. The rate of diffusion of novocaine in the subarachnoid of the cord is about 1 to 5, or 1 to 7 in ten minutes.

9. The rate of diffusion of novocaine in the cisterna magna of dogs, using a 1 to 30 dilution, was 1 to 2.46 in 1 minute, 1 to 6 in 2 minutes, 1 to 10 in 3 minutes, 1 to 27.6 in 5 minutes.

10. Death may come from cardiac anemia or brain stem anemia without respiratory block, or may be due to paralysis of respiration due to block of the respiratory nerves.'

SPINAL ANESTHESIA AND THE TRENDELENBURG POSITION

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The main function of the Trendelenburg position in spinal anesthesia is to counteract exteremely low blood pressures that sometimes occur. Lowering the patient's head before the novocaine has become fixed in the nerve roots is a mistake because it will often cause an unnecessary fall in blood pressure. The upper thoracic and cervical verterbae would then be dependent and, since novocaine dissolved in spinal fluid has a higher specific gravity than spinal fluid alone, the anesthetic may gravitate to levels that are higher than necessary.

Immediately after injecting novocaine into the spinal canal the patient's head and neck should be raised upon a pillow and kept in that position until the novocaine has become fixed in the nerve roots. This takes from five to fifteen minutes, depending on the amount of the drug injected. If there is no marked fall in blood pressure before this time, the Trendelenburg position can then be used without increasing the height of anesthesia or causing a fall in blood pressure. If a marked fall in blood pressure occurs before this time, the Trendelenburg position must be used at once. Further fall in blood pressure due to higher anesthesia must be disregarded. The head of the table must be lowered to get blood to vital centers and this position maintained until anesthesia wears off.

The injection of 150 mg. of novocaine dissolved in 3 cc. of spinal fluid at the rate of 5 seconds per cc. between the second and third lumbar vertebrae, with the patient lying on his side for the injection and turned on his back immediately after the injection, will give an anesthesia high enough for the average appendectomy. If at the end of five minutes anesthesia should not be sufficiently high, the head of the table should be lowered. This will aid in raising the height of anesthesia. Should this solution be injected at the same rate but between the fourth and fifth vertebrae and should the patient be immediately placed in the Trendelenburg position, the anesthesia would be higher and the fall in blood pressure greater.

Dr. B. F. Mullen of Seattle has used gravity to confine anesthesia to one side of the body for amputations of the lower extremities. He injects a small amount of novocaine with the patient lying upon the side to be operated on and keeps him on the same side. Anesthesia is complete in the dependent leg and is absent in the other.

The influence of gravity upon spinal anesthesia is one of the cardinal factors determining the technic of its application in special solutions such as Pitkins. However, gravity affects all anesthetic agents in the spinal fluid, a fact well appreciated by Houghton and Barker[1] and Evans.[2]

556 Stimson Bldg.

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[1] Houghton, J. W. H. and Barker: Burghard's System of Operative Surgery, Oxford University Press, London, 1909.

[2] Evans, C. H.: Spinal Anesthesia. Paul B. Hoeber, Inc., New York, 1929.

THE ACUTE EAR *

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This is a condition which has many times been adequately described in great detail, and it is not my expectation to add any new facts or theories as to its causation or pathology, but rather, in view of its frequency in the practice of every doctor, to outline a method of treatment which in my experience has been very satisfactory. The term, "acute ear," is a bit indefinite and might be thought of as including acute inflammations of the external ear, but in this discussion the latter will be mentioned only from the differential diagnostic standpoint, and we will confine our attention to those infections of the tympanum which develop rather suddenly on a basis of one of the acute infections, or through the extension of nasopharyngeal infection via the eustachian tube to the tympanic cavity and membrane.

The causes of acute otitis media are in the main pretty well known. It has been estimated that 80 per cent of the cases are based on acute or exacerbations of chronic conditions in the nose and throat. The acute conditions pass under the name of a "cold," now usually spoken of by the laiety as as "sinus." The chronic may be infections of the tonsils, adenoids, accessory sinuses, or we may possibly go back a step further and relate the condition to nasal obstruction by a deviated septum. The anatomic relation of the nasopharynx and the tympanic cavity is such as to make this extension very easy and the wonder is that it does not happen oftener than it does.

The exanthemata furnish another very common cause of acute ears, and as the ones most likely to affect the ears affect also the nasopharynx, it is likely they too migrate via the eustachian tubes. Influenza, although not strictly speaking an exanthem, is, I believe, more likely to involve the ears than scarlet fever and measles, which are the ones usually mentioned.

A third direct cause is swimming. Infective material in the nasopharynx is easily carried into the tubes, when the nose is forcibly blown to rid it of water. Whether in connection with swimming or not, it is probable that improper nose blowing, when the nostrils are obstructed by swollen turbinates, has a great deal to do with the extension of the infection through the tubes to the ears.

Adenoids are to be considered as a continual menace, harboring, as they do, infection in their folds, and when large, obstructing the posterior nasal openings. Infected and hypertrophied tonsils also render one more susceptible to colds and thus indirectly promote disease of the ears. Scarlet fever is more destructive and more liable to involve the mastoid than measles. Lately I have seen two cases in which measles developed during the course of acute otitis media without any apparent aggravation. Back of all these secondary involvements, lack of bodily resistance undoubtedly accounts for the development of many cases, which the above mentioned exciting causes alone would be incapable of producing.

It is customary to classify acute middle ear disease as catarrhal and purulent. The distinction is not at all clear, as it is difficult to say at times whether it is one or the other. Some cases begin as catarrhal and end as purulent. Some authors object to the word catarrhal, as they say the discharge is serous rather than mucous. The same bacteria have been shown to be present in both conditions. Kerrison[1] calls those which involve only

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* Read before a Meeting of Lane County Medical Society, Eugene, Oregon, Feb. 19, 1931.

[1] Kerrison, P. D.: Diseases of the Ear, p. 158.

the atrium catarrhal, and those which involve both atrium and vault purulent, but the logic of this distinction is difficult to understand.

For practical purposes it seems to me there is little use of making any distinction. If the process stops short of becoming purulent we may be thankful; if not and we have treated it with strictly aseptic care, we are not to blame. Those cases, which begin and end simply as earache without rupture of the membrane, may safely be considered as catarrhal and why they do not all become purulent when bacteria are known to be present is a question for which there is only a theoretical answer.

When confronted with a case of ear pain it is essential that we determine as soon as possible whether we are dealing with otitis externa or otitis media. The character of the pain, whether it is stinging and radiating rather than a dull, heavy, aching or throbbing, will tell something, but the most reliable symptom is great sensitiveness of the auricle to the slightest manipulation, and pain in the region of the tragus. A little later pain in the canal becomes severe and as the tissues swell tinnitus develops, and finally, when the canal is occluded, the hearing is very nearly abolished. If a discharge is present, it is seldom profuse and is a late symptom, as it results from the rupture of a circumscribed swelling (furuncle) or comes from the moist desquamation of the lining of the canal (diffuse inflammation). These symptoms as a rule are evident on inspection so there is little danger of confusion. There is also no tenderness over the mastoid antrum.

Having, then, eliminated acute external otitis and determined that we have to deal with an acute condition of the tympanum, it is necessary to ascertain the duration and severity of the pain and to examine very carefully the drum membrane. The importance of knowing the duration arises from the fact that rupture seldom occurs under six hours and usually not under twenty-four, though in some cases it is delayed for forty-eight or even longer in cases beginning in the vault and extending back into the mastoid antrum. Great severity of pain usually denotes rapid development. It is always regrettable to allow spontaneous rupture, and the duration and severity in connection with the appearance of the membrane are our criteria for knowing when to interfere.

For examining the drum, an easily manipulated electrically-lighted auriscope is to my mind very essential. I much prefer one with a very small handle, connected to the battery by a cord. With this one is able to maneuver in such a way as to get a complete view of the drum without causing pressure on the walls of the canal and thereby pain. It is proper to select the largest tip which can be inserted into the canal for a considerable distance. Anything which it cannot pass and which obstructs the view must be removed. A slight change then of the axis of the instrument will bring the entire drum into view.

Of course, it goes without saying that one should be familiar with the normal appearance and landmarks of the drum. The short process of the malleus in the upper central part is about the last landmark to become obscure and its recognition is very important, as it will give us the lay of the land. Above this landmark in all cases of middle ear inflammation, Sharpnell's membrane will be found reddened. The rest of the drum, the membrana tensa, will likely be a dull, reddish gray in the early and red in the later stages. The triangular light reflex will be gone. Bulging, if present, will be below and back of the short process. It is here that we may mistake a bulla or blister for a bulging drum.

It is a question whether or not inflammation of the drum membrane alone, not involving the tympanic cavity or the auditory canal, is really a diseased entity. Good authority may be cited on both sides of the question. Ullman[2] very ably argues the existence of such a condition. On the other hand, Kerrison,[3] to whom we are indebted for one of the most complete textbooks on otology, admits that he has never seen a case of myringitis, in which he was sure there was not at the same time involvement of the tympanum. The affirmative declare that the character of the pain and onset, the slight degree of hearing impairment and the blistered appearance of the drum are reliable signs, and they place the disease in the category of herpetic affections. Just how important is this question is difficult to decide.

It would seem not only unnecessary but improper to extend the incision through all the layers of the drum, if the tympanum itself is not involved. Kerrison,[4] however, thinks that if this is not done, some products of inflammation might be left in the tympanum. If the contents of the bulla really contain infective material, it would be better not to incise the membrane. The fact that it is often

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2. Ullmann, E. V.: Myringitis Bullosa, North. Med., 30:14-16, Jan., 1931.

3. Kerrison, P. D.: Diseases of the Ear, p. 156.

4. Ibid. p. 156.

done without subsequent serious consequences makes it seem a matter of less importance. When the paracentesis is done with strict aseptic precautions, the danger connected with the operation is very slight. On the whole, it seems to me better to incise the drum when it is not needed than to refrain from doing so when it is needed.

Some writers claim that rupture will occur earlier in catarrhal cases, where the accumulation of fluid is confined to the atrium. When the infection originates in the vault, swelling of the lining membrane shuts it off more or less completely from the atrium, so that the fluid finds its easiest extension backward into the mastoid antrum. In these cases the pain may continue for several days without rupture, is of a severe boring character, and may be more or less intermittent. There is likely to be tenderness over the mastoid antrium which may even in fairly mild cases extend to the tip. We are not, however, attempting a discussion of mastoiditis, except to say that it is easy to accept the dictum of Politzer who held that every inflammation of the middle ear involves also at least the antrum of the mastoid. This is most surely true of the purulent type, involving primarily the tympanic vault.

A good number of patients with middle ear disease are, as we all know, infants. It is often difficult to tell whether a child less than a year old has otitis media. Some observers hold that very young children do not have earache, even in the presence of middle ear inflammation. This is probably not strictly true, but at the same time the only evidence we sometimes have, before examining the ear, will be rather an unaccountable rise in temperature and an unusual restlessness and fretfulness. Sometimes the mother will say that the child is constantly pulling at its ear.

It is a good rule to examine the ears of all children, when their temperature and restlessness cannot otherwise be explained. In fact, some pediatricians under these circumstances insist upon a paracentesis of the drum. I have frequently known children who gave no objective evidence of ear trouble, but were carrying temperature which promptly subsided after opening the drum, although no amount of fluid was evacuated. The above statements are especially applicable to children during the course of an acute cold or one of the exanthemata.

As I said at the beginning, my purpose in offering this paper is to outline a treatment which, though judged by the usual standards, might be considered unorthodox, has nevertheless proven very satisfactory and, it seems to me, when judged from the standpoints of effectiveness and convenience, has some points in its favor.

When confronted with inflammation of the middle ear, the relief of pain is the paramount consideration, and although the etiologic factor should receive attention later, we can well neglect it until the pain is taken care of. If seen early, within a few hours of the onset, it may be possible to avoid an acute catarrhal inflammation. At this stage the following prescription, slightly warmed and dropped into the ear, will give relief for a time.

Rx:
Phenol.
Chloral hydrate a.a. 1 dram.
Glycerine q.s. 1 ounce.
Sig.: Warm and drop in the ear.

Sometimes hot water dropped in the ear is equally as good.

We have also our choice between hot and cold applications, and it is my belief that ice-packs most often give relief. Unless this relief is permanent, paracentesis of the membrane will in all probability be necessary.

It is a great mistake to attempt to incise the drum without the use of a general anesthetic. This applies equally to infants and adults. Forcibly to hold a child, while the drum is incised, is nothing short of brutal, and the operation is almost sure to be poorly done, as it is essential that an incision and not a puncture be made. This is practically impossible while the patient is moving about.

A good clear view of the drum is necessary and the incision should be made with great deliberation and care, extending from the posterior fold downward to the lower posterior margin of the drum. In an older child or an adult, the situation is much the same. No matter how much will power or desire to cooperate there may be, when an exquisitely tender ear drum is touched with the point of the knife, any patient will involuntarily jerk and your incision will be a failure.

Local anesthesia, in spite of claims made for it by those who have developed some personal prescription, is simply ineffective. As to the anesthetic of choice, I prefer chloroform. In fact, for a short term anesthesia, I consider it ideal when properly given. Nitrous oxide gas is the one most frequently recommended, but it has the disadvantage of requiring a special apparatus and at times the patient will awaken too quickly for the work to be done with due care. Then, too, the mask which must be pressed down tightly on the face, is very frightening to a child.

Some operators begin at the bottom and carry their incision upward and through the posterior fold into Shrapnell's membrane in order to open the vault. I have never done this and do not positively know of any case which would have done better had I done so. I usually begin just below the posterior fold and carry the incision downward to the lower border of the drum. Hays[5] recommends that the incision be carried parallel to the periphery of the drum for a distance of two-thirds of the circumference. This seems to me to be too much, but it is nevertheless true that a short incision is likely to heal so quickly as to require a second incision.

Having opened the drum head, most writers next insist upon the necessity of frequent irrigation. It is here that my technic begins to differ. I make a practice of filling the canal with a two per cent solution of mercurochrome and plugging the ear with cotton. The mother or the patient, if he is an adult, is then instructed to do nothing to the ear whatever except to change the cotton, when it becomes saturated with pus.

I make no claim to originality in this, as I noticed in the Neumann Clinic in Vienna that, after paracentesis, the auricle and vicinity were smeared with zinc oxide ointment and a large pad of cotton and gauze bound on with a bandage to be left unchanged until the next clinic day. The unreliability of their home treatment made this necessary. I feel, however, that we can trust our patients to renew the cotton without contamination, but I doubt whether syringing should be trusted to those untrained in aseptic technic.

The temperature is to be observed twice a day, and a record kept and brought on the next visit which will be on the second day. A general downward tendency in the temperature is a good indication, and a gradual upward tendency may be interpreted as an extension of the inflammation. In the meantime, the patient is to have a cathartic and be kept in bed with the ear on an icebag.

This is a considerable departure from the ordinary treatment, inasmuch as practically every textbook I have consulted recommends the application of heat, and if cold is mentioned at all, it is usually condemned. Nevertheless, in a series of about eighty cases I have found very little objection on the part of the patient to the use of ice. On the contrary, it is quite comfortable and soothing and even small children will ask to have the ice-bag refilled when it becomes warm. There is surely as much logic in the application of cold to an acute ear as in the case of an acute appendix, and I believe the inhibition of bacterial growth is of equal importance to any hyperemia effected by the use of heat.

At the time of each subsequent visit, which is on the average every second day, the ear canal is syringed with a solution of 1-4000 cyanide of mercury. This is merely for the sake of inspecting the drum and not at all for the purpose of treatment. For it is quite clear that no amount of syringing can do more than merely cleanse the canal and, unless this is done with great frequency, it is also clear that the period during which the canal is cleansed is too short to be of any particular value. If the syringing were done, say every two hours, this might obtain, but it would have to be done in a majority of cases by some one wholly inexperienced in aseptic technic, and the harm which would be done would likely far outweigh any benefit. The cleansing which occurs at the time of the office visit is quite sufficient to keep the discharge from become either fetid or desiccated.

As soon as the discharge has ceased, it is wise to begin inflation through the eustachian tube for the purpose of preventing adhesions. It is probable that it may be begun considerably earlier with benefit. The fear of forcing some of the discharge backward into the mastoid is largely unfounded, unless the drainage opening has closed and a considerable amount of pus remains in the tympanum. Vibration with some mechanical contrivance is also of value at this time, to prevent or break up possible adhesions of the drum head to the promontory or other adhesions involving the chain of ossicles.

In the series referred to above, only one has resisted this treatment and it is probable that this was due to the type of infection present. No case has become chronic, so far as I know, and following this line of treatment, the hearing, as a rule, is very little impaired.

SUMMARY

1. Acute otitis media is a very frequent and troublesome condition, fraught with serious consequences if improperly treated.

2. Reliable statistics seem to indicate that about eighty per cent of the cases originate in the nose and nasopharynx.

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[5] Hays, Harold: Diseases of Ear, Nose and Throat, p. 272.

3. Classification as acute catarrhal and acute purulent are really of only academic interest.

4. The treatment of cases that are not easily aborted includes myringotomy under general anesthesia (chloroform preferred), a large curvilinear incision reaching from the posterior fold to the floor of the canal being made. Observations is made of the temperature twice daily and cleansing of the canal every other day, and as nearly as possible the application of ice continually during the first four or five days or longer, if necessary.

5. Under this treatment the discharge will usually close in less than two weeks, the drum membrane healing without scar, and the hearing unimpaired.

DELAYED ULNAR PALSY*

CASE REPORT

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Injuries about the elbow joint occasionally give rise to disturbed function of the ulnar nerve. Fractures and particularly posterior dislocations, unless carefully managed, may produce delayed palsy of this nerve. In spite of the best care, elbow injuries in childhood may in later life give rise to an ulnar palsy. The symptoms and signs of such palsy are oftentimes so insidious in onset and extend over so long a period of years that the average case does not come under surgical observation for many years after the injury.[1]

The changes in function of the nerve are due to swelling in the nerve at the point where it passes through the ulnar groove. The nerve trunk is pinkish and tender and oftentimes swollen to several times its normal diameter.

The symptoms are gradual in onset and progressive in nature and include both the motor and sensory tracts. The patient frequently complains of pains radiating into the little and ring fingers, especially when flexing the elbow. He also notices an actual impairment of sensation or paresthesia in the little finger and the ulnar side of the ring finger. There is a gradual wasting of the intrinsic muscles of the hand, particularly the interossei, the two lumbricales and the thenar and hypothenar eminences. Associated with this there is a gradual contracture of the fingers on the ulnar side.

Practically all of these cases give a history of an injury to the elbow joint many years or months antedating the onset of symptoms. The development of the above picture is usually so slow that it is not recognized until it is well advanced. By this time considerable weakness, atrophy and contracture of the muscles have occurred.

The treatment is purely surgical, followed by prolonged and patient physical therapy. In all of these cases a transplantation of the nerve from the ulnar groove to the antecubital space is necessary, preferably under the flexor carpi ulnaris or the pronator radii teres. The writer personally prefers transplantation beneath the latter muscle. If there is considerable fusiform swelling, and there usually is, a decompression of the nerve should be carried out by making longitudinal slits in the sheath down to the nerve fibres.

The following case is typical of delayed ulnar palsy.

Mrs. G. G.. Seen on February 3, 1930, at the request of Dr. R. D. Forbes. Forty-one years of age, married, a bookkeeper by occupation.

Chief complaint. Numbness and weakness in the right hand with shrinking of the muscles of the hand. Pains into the little and ring fingers and some numbness of the thumb and forefinger.

History. She gave a story that when about fourteen months of age she fell over a tub, injuring her elbow. She was treated by the family physician for sprain. Later a dislocation was discovered and treated. Through a period of many years she has noticed a gradual wasting of the muscles of the right hand and numbness and tingling with contracture of the little and ring fingers. She has received massage and exercise of the hand off and on for several years. Just recently she has noticed some numbness in the thumb and index finger and occasional dull pains radiating along the ulnar side of the arm into the little finger.

Examination shows a typical ulnar anesthesia with disturbance in the modalities of pain, temperature and touch over this area, with a slight overlapping into the median distribution (atypical ulnar). There is atrophy of the interossei and lumbricales of the hand. The thenar and hypothenar eminences are both flattened. There is weakness of the little and ring fingers and Froment's sign is positive. The hand has the appearance of the main en griffe and there is inability in spreading the fingers in a fan-like fashion (fig. 1). There is difficulty in flexing the forearm, and the elbow is held at an angle of about thirty degrees. The ulnar nerve is distinctly palpable. It has a fusiform shape and is quite tender. The olecranon is in the position of a posterior dislocation.

Radiogram by Dr. Frank Bourns reports: "Very marked deformity of long standing. The head of the radius is in apposition with the capitellum which, however, is entirely separated from the humerus (fig. 2). The olecranon process of the ulna is distorted."

Operation was performed February 4 with a complete freeing of the ulnar nerve from its bed in the ulnar groove and transplantation to the anterior part of the forearm, the nerve being placed under the pronator radii teres. The muscle was then sutured with interrupted chromic gut. The median nerve was also inspected and found normal in appearance.

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* Read before a Meeting of King County Medical Society, Seattle, Wash., 1930.

[1] Stewart, P. and Evans, A.: Nerve Injuries and Their Treatment. Oxford Med. Pub., p. 167.

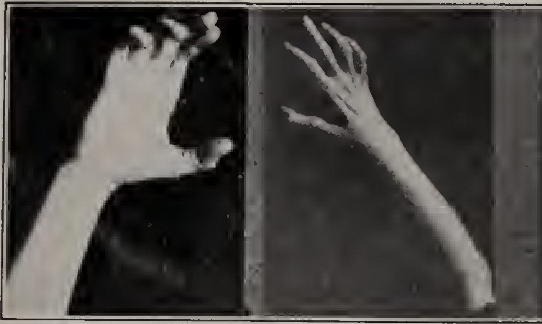

Fig. 1

Fig. 1. Photographs at time of operation. Note claw hand.

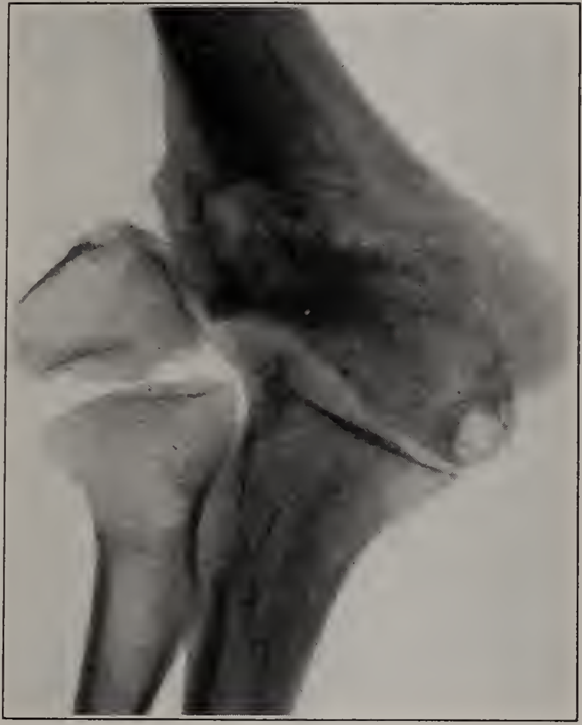

Fig. 2

Fig. 2. Shows old marked deformity of elbow.

Following the operation there has been steady improvement under massage and exercise. The tone of the muscles has improved and the patient is now able to freely extend the fingers and move the elbow with more freedom (fig. 3). There has been no pain and the sensation is now normal.

Medical and Dental Bldg.

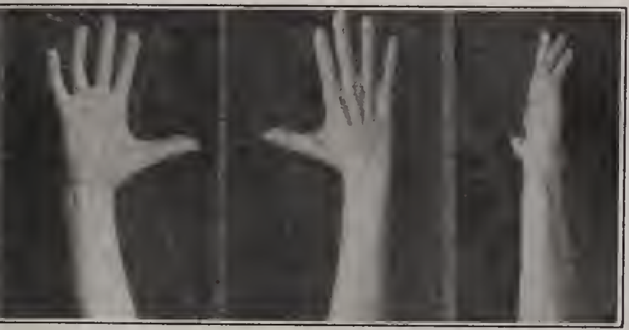

Fig. 3

Fig. 3. Photographs one year following ulnar nerve transplantation. Note improvement of muscular development and ability to extend fingers.

A HISTORICAL SKETCH OF CHOLELITHIASIS*

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Diseases may usually be classified historically as either of great antiquity, as proven by the clinical descriptions found in ancient manuscripts and the existence of the pathologic changes in mummies of the pre-Christian epoch, or of recent origin, such as syphilis, trench mouth, etc. Cholelithiasis differs from this classification in that there has been found a gallstone in an Egyptian mummy dating about 1500 B. C.,[1] yet it was not until the close of the middle ages that even so striking a symptom as gallbladder colic was described. Reasoning by deduction from this, the conclusion appears in all probability valid that cholelithiasis was a very rare ailment among peoples of ancient civilizations as compared to its frequency today. It is interesting to speculate upon the reason for this, and it has been pointed out that people of the older civilizations continued to exercise throughout their lives and to live on a simpler diet than that consumed by their modern descendants.

Thus, until the fourteenth century, there was a complete absence of knowledge concerning this very frequent modern disease. No one had either described it clinically or mentioned the occurrence of stones in the biliary tract. Probably the first discovery of the existence of gallstones was by the Jews. In Joseph Caro's sixteenth century codification of the Talmudic Law,[2] there are mentioned not only all of the common developmental anomalies of the gallbladder (absence and bifurcation), but there occurs the following description of stones: "If hard things are found in the gallbladder which are like the pits of dates, being without sharp edges, the animal is kosher (fit to eat). But if the edges are sharp as in the pits of olives, the animal is terafah (forbidden), it being assumed that the pit has perforated the gallbladder in entering, the reason why the perforation is not visible, being that it has healed over with skin." There is no mention of their having been found in humans.

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*Work done when on a part time research fellowship at The Mason Clinic, while engaged in a study of cholelithiasis.

*Read before the Eastside Medical Club, Kirkland, Wash., May 21, 1931.

[1] Phillips, John: Diseases of the Liver and Biliary Tract. Oxford Monographs on Diagnosis and Treatment, VIII: 467.

Historians[3] have not decided to whom the credit of first finding concretions in the biliary tracts of humans should belong. According to legend, Gentalis of Foligno noticed the occurrence of stones in the gallbladder of a human. None of his extensive writings mentions the fact, however, so that credit for the first description of this finding lies not with him but, a century later, with Antionius Benivenius (who died in 1592). By profession he was an undertaker, and in his writings he mentions the finding of stones in the gallbladder of a woman whom he was preparing for burial. One gains respect for this man on reading that he informed himself that his subject's chief symptom in her last illness was abdominal pain, which he probably very wisely attributed to the presence of these stones, and concluded that the presence of these biliary concretions was to be regarded as the immediate cause of death.

Fernelius at about the same time (1554) gave the first clinical description of the symptoms arising from the presence of such stones. His observations are remarkably accurate and include not only colic and abdominal tenderness but the astute observation that, if the stone lodged in the common duct, there resulted white stools and a dark urine, accompanied by a swelling of the gallbladder. Like every subsequent investigator of this disease, Fernelius had his theory as to the formation of these concretions. It must be remembered that according to the teachings of the best humoral physiologists, the bile originated not in the liver, but in the gallbladder, from which it was passed to the liver, where the blood took up what portion it desired, the rejected bile returning and entering the intestines by way of the ductus choledochus. With this as his physiologic basis, he believed that gallstones were formed when the bile remained over long in the gallbladder, and that they were especially apt to form when there existed an occlusion of the cystic duct. This theory, like all those that have since followed it, remained unchallenged for only a short time.

In 1563, Paracelsus, chemist and physician, father of biologic chemistry, propounded his tartaturus or stone disease theory. This held that stones formed in the body were produced in a purely chemical way, and were not a vital process. Although this was elaborated with renal stones in mind, he shortly applied it to the formation of stones in the biliary tract.

Except for the work of Glisson, in which he demonstrated that the only nerves in the liver were in the capsule and ducts, hence the pain in cholelithiasis must result from the stretching of these ducts by concretions passing through them, the next important contribution to the subject was that made by Wepfer in 1658. By careful observation he came to the conclusion that the bile was not formed in the gallbladder but in the liver. He published this finding with sufficiently convincing arguments so that it became gradually accepted long before the downfall of humoral pathology.

Not until the opening of the eighteenth century do we have a modern or near modern presentation of the subject of cholelithiasis. This was a treatise by Ettmuller of Germany, published in 1708. He was apparently the first to notice that the disease occurred with a special frequency in multiparous women. While he limits his discussion of the disease to those cases which have pain, he notices the various grades of severity and constancy of this symptom, and that usually there is accompanying the pain a tenderness in the upper right quadrant. He emphasizes the point that icterus is not a necessary accompaniment to cholelithiasis but occurs only if the bile is denied entrance into the intestinal tract. It is very interesting to note that he regarded the diagnosis of cholelithiasis as a purely provisional one, unless it could be demonstrated that the stone was passed by the intestinal tract. He has no views as to the therapy in this condition, saying there is nothing to be done.

Besides giving this excellent clinical picture of the disease he should be remembered in connection with cholelithiasis for an event of far-reaching importance which he recorded. He was the first man to mention the fact that the gallbladder could be removed without endangering the life of the organism, stating in his writings that, during the time he was teaching at Leyden, one of his students removed the gallbladder of a dog, the animal recovered and apparently was not seriously deranged. All these facts, emphasized by Ettmuller, while they sound axiomatic today, were at that time not only new but highly unorthodox. As outstanding a clinician as Sydenham, while recognizing biliary colic as a syndrome, believed, nevertheless, that it was of a purely hysterical etiology.

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[2] Graham, E. A., Cole, W. H., Copher, G. H., and Moore, S.: Diseases of the Gallbladder and Bile Ducts, p. 42, Lea & Febiger, Philadelphia, 1928.

[3] Hoppe-Seyler, F. A.: Historical Aspect of Cholelithiasis, Diseases of the Liver, Pancreas and Suprarenal Capsules, Nothnagel's Practice. Translated by A. Stengel, pp. 525-31. Saunders & Co., Philadelphia, 1903.

This marks the close of the purely nosologic period in the development of the knowledge of cholelithiasis, and we have the next, or pathologic-surgical epoch, opening with a paper published by Gottfried Müller in 1742. He reports a case in which an abscess burrowed through the abdominal wall and ruptured. This opening was enlarged and the stones contained in the gallbladder crushed and removed.

A similar observation was reported in the following year by J. Petit. He was much more decided in his views, however, and boldly advocated that the mass be punctured, the opening enlarged, and the stones removed in this condition of empyema of the gallbladder resulting from stones, providing the organ was adherent to the wall, i.e., if it was immobile and the skin over it was reddened. In all the history of gallbladder disease, there never has been a paper which brought so much criticism to its author as this; the profession was almost solidly united in condemning Petit as a dangerous, heartless radical.

However, as is frequently the case in such instances, this new and radical treatment gradually was accepted, and with its acceptance no further surgical process was made for one hundred twenty years. This period was marked by small gradual gains in the clinical knowledge of the disease and of its pathology. The true surgical era in the treatment of cholelithiasis began on June 15, 1867.

It was on this date that Dr. John S. Bobbs operated upon a woman for an abdominal tumor of undetermined origin, and did a cholecystotomy.[4] Bobbs was American born and had all his training in this country. Raised in Pennsylvania, he graduated from Jefferson Medical College in 1836 and after a few years located in Indianapolis, where this major event in the history of abdominal surgery took place. In relation to the importance and unprecedented nature of this operation, it is interesting to learn a few of the available details[5] concerning the character of this daring surgeon. In appearance he was striking, tall, dark, with sharp, decisive features. His character was thoroughly in keeping with these distinguished features.

The two salient characteristics of his medical life were his interest in medical societies and his extreme distaste for anything flavoring of hypocrisy. As an organizer of medical societies, he should be remembered as one of the founders of the Indiana State Medical Society. His avoidance of shams was almost carried to the extreme of a mania. It is stated of him that at no time in his medical career was he known to give a placebo. His therapeutics were unusually rational and conservative, in contrast to the polypharmacy of his day. When called into consultation, he frequently prescribed the discontinuance of all medication save sedatives for rest.

In the spring of 1867, a woman, age 30, was brought to Bobbs for consultation. Her complaint was that of an abdominal swelling, first noticed four years previously, which had gradually grown throughout this time. At the time of his examination it had reached such a size that the patient was incapacitated from her occupation, that of a seamstress. Accompanying the development of this tumor, there had been a marked degree of gastric irritability. This was manifested by anorexia, nausea, occasional vomiting and distress, beginning immediately after eating and lasting for three to four hours.

Bobbs examined this patient and found a mass involving the entire right side of the abdomen which, however, could not be demonstrated as of pelvic origin. He had the patient return home and examined her a month later. The mass being unchanged and the patient pleading for surgery, finally he consented with reluctance. The date was set, and with chloroform as the anesthetic, the operation was begun. Bobbs had as his assistants six doctors and one medical student. A low midline incision was made and, after some difficulty with omental adhesions, the tumor was exposed. In order to deliver it into the wound, the incision had to be carried an inch above the umbilicus, after which it was delivered through the incision.

He describes the remainder of the operation as follows: "This (the tumor) was found to be oval in form, about five inches in length and two inches in diameter at its widest part, tense and evidently containing a pellucid fluid. No pedicle could be made out, and the sac showing its contents to be transparent, its lower margin was cut through, when a perfectly limpid fluid escaped, propelling with considerable force several solid bodies about the size of ordinary rifle bullets. Introducing the finger, other solid bodies were felt but not in the main sac. A number were hooked out with the finger, and varied in size from that of a mustard seed to that of a bullet. One of the latter size could be distinctly felt, but no communication between the space containing this and the main sac could be found, and it was not removed, being situated at the extreme end of the finger. The sac had the appearance externally of an hydatid; its walls were of the thickness of ordinary cuticle, smooth in its inner aspect, and were whitish and semipellucid. Pulling it downward, after it was evacuated, brought into plain view the right lobe of the liver, to the lower surface of which it was attached by a broad linear base like the gallbladder, which seemed to mark its identity with the gallbladder and deterred me from the excision of the sac, as I should otherwise have done. I, therefore, put a stitch in the cut lips of its walls and cut the ends closely."

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[4] Bobbs, J. S.: Trans. Ind. State Med. Soc.

[5] Tinker, M. B.: The First Nephrectomy and the First Cholecystotomy. Johns Hop. Hosp. Bull., 12:247, Aug., 1901.

Thus was the first cholecystotomy performed, and it is interesting to note that a follow-up of this woman many years later revealed that she continued to have gastric distress, which she blamed on the fact that Bobbs had left one stone. This operation, though promptly reported in the *Indiana Medical Journal*, was not repeated for eleven years.

In 1878 Marion Sims performed the same operation, and a year later W. W. Keen also reported one case. Both of these later writers had the misfortune to lose their patients. This, strangely enough, seemed to start the vogue for this operation, for by the year 1890 there were fifty or more similar successful operations recorded in the literature.

While America may clain the first operation of cholecystotomy, to Germany goes the credit for the first cholecystectomy. This was performed by Langenbuch[6] on July 13, 1882, and, in contrast to the first cholecystotomy, was done only after much patient research. With Teutonic thoroughness Langenbuch analyzed the problem into its two essential features. First, could the gallbladder be removed without physiologically interfering with the life mechanism of the organism? For the answer to this, he studied in the realms of comparative anatomy and formed the conclusion that the absence of the gallbladder was not incompatible with life, from the premise that in some species of animals it is congenitally absent. The second feature was the technical difficulties that would attend such an operation. After much experimenting on cadavers, he came to the startling conclusion that removal of the gallbladder with prior ligation of the cystic duct was one of the least radical of abdominal operations.

The technic which he developed, working on cadavers, was as follows: "The abdominal cavity is opened by means of a transverse incision through the integument of the right half of the abdomen. A longitudinal incision is made, following the outer border of the rectus muscle. Both incisions are 10-15 cm. long, and together form the letter T. The gallbladder, fastened to the lower surface of the liver, lies free at its tip. The colon is pushed downward by means of the introduction of a large flat sponge, and with it the small intestines below the incision. The somewhat forward projecting right lobe of the liver is raised and thus the hepatoduodenal ligament is rendered taut, so that it protrudes out of the depth of the abdomen and its margin may be held between the fingers of the left hand. In this fold are situated the large biliary ducts, and medially the portal vessels. In order to separate the cystic duct, it is well to lay free the gallbladder. Around the cystic duct a silk ligature is passed, catgut not being suitable for this purpose. Only after these preparations and in addition the removal of its peritoneal covering, can the removal of the gallbladder take place."

Following this technic, he removed successfully the gallbladder of his first patient. His next three cases ended fatally but he had made a start and by 1890 Courvoisier was able to collect ninety-seven instances of this operation.

Another procedure which came into temporary favor was that of cholecystenterostomy, but this was largely discarded after 1890. From this time down to the present day, the arguments have been advanced, first in favor of cholecystotomy and then in favor of cholecystectomy. In recent years, with the advent of careful follow-up studies on the patients, cholecystectomy has been proven superior in all but the more acutely inflamed cases.

Having now considered the surgical aspects of the disease, let us return to the early eighteenth century and trace the development that took place in biliary physiology and the medical aspects of treatment of diseases of the gallbladder. Following Ettmuller's dissertation, the next advance was that made by Vallisnieri in 1722. He discovered that gallstones were soluble in alcohol and turpentine and drew from this the startling conclusion that turpentine would act as a preventive of gallstones. His contempararies became even more enthusiastic and went so far as to allege that this substance would dissolve stones already formed.

One can arrive at the current opinions of the time on this subject in no better way than to quote Frederich Hoffman's views on cholelithiasis in the year 1733. He attributes the formation of gallstones to the stagnation of bile and believed that eating little and at long intervals favored this. He argued that normally the stomach should be sufficiently distended to exert pressure on the liver and in this manner aid in the expression of the contents of the gallbladder. He lists as predisposing factors in the occurrence of this disease the abuse of alcohol, especially beer, age, and the female sex, especially at the period of the menopause. He believed the radiation of the pain to be due to the irritation of the phrenic nerve. Colic, jaundice and the passage of stones were regarded by him as the three diagnostic criteria of the greatest value.

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[6] Langenbuch, C.: Berlin, Klin. Wchnschft, 19:725-7, Nov., 1882.

With the rise of pathology in the latter half of the eighteenth and the entire nineteenth centuries, there was gradually accumulated a more detailed knowledge of the symptoms and pathology of gallstones. Of especial note in this period are the painstaking studies of Haller and Morgagni on the pathology of the gallbladder, and the stimulating work of Charcot on the various types of fever that may be associated with gallstones. A more comprehensive study of the symptoms which are caused by this common disease was not arrived at until the era of modern surgery and roentgenology was ushered in at the start of the twentieth century.

The next field to be developed which was to have a bearing upon the diagnosis and treatment of cholelithiasis was that of intubation of the stomach. One is amazed to learn that the first intubation of this viscus took place in the latter part of 1821 and had been performed by two English physicians independently before the close of 1822.[7] It was first developed as a means of removal of poisons which had been swallowed, having in mind especially opium and its derivatives. It was not until almost forty years later that gastric lavage was first used as a means of combating gastric dilatation due to pyloric obstruction, being first practiced in this connection by the German clinician, Kussmaul, in 1867-9.

Studies on gastric juice date back to 1752, however. In that year a Frenchman, Rene DeReaumur[8], obtained from a pet bird pure gastric juice. He demonstrated its solvent action on common foods. Spallanzani a few years later demonstrated that it was not only a food solvent, but was acid in reaction, and would act as a preventive of putrefaction and fermentation. The fact that its acid character was due to the presence of muriatic acid was discovered shortly after this.

And now came the startling experiments and observations of a distinguished American, William Beaumont. By means of an accidental gastric fistula in a half-breed, Beaumont conducted the first, the most important, epoch-making experiments as to the action of gastric juice. His was in reality the only notable forerunner of the work of Payloff with his experimental gastric fistulae and pouches (1880-90)[9].

After Payloff's experiments we have the first appearance of the test meal, the Ewald test breakfast. Now the vogue for gastric lavage really began. It became quite the fad, and was the panacea par excellence of the early 1900s. Strangely enough, while there rapidly grew up a vast literature which concerned itself with the existence of the various strengths of HCl which were discovered in the stomachs of patients suffering from various ailments, there elapsed a very considerable time before these first came to be connected as of any significance to the entity of cholelithiasis. As late as 1909, no less an observer than Graham of Rochester[10] barely mentions the subject of gastric acidity, when dealing with differential diagnosis between gastric and duodenal ulcer and gallbladder disease.

Reading this early literature, one questions whether this indifference was caused by the clinicians of that day being either too aware or too negligent of the phsyiologic mechanism of the regulation of stomach acidity. The term pylorospasm is a favorite one and is the explanation by which all hyperacidity related to an organic cause is explained, while hypochlorhydria is obviously, according to the texts and papers of that day, a result of chronic gastritis. The introduction in 1914 by Rehfuss of fractional expression, together with the parallel development which was being made in the field of surgery and roentgenography, soon led to the golden era of the stomach acids, which were used in this period of 1915-20 with the greatest avidity and the heaviest diagnostic responsibilities placed upon the titration figures. Thus, while in 1910, if gastric juice is mentioned at all in relation to cholelithiasis, it is said to be increased, due to a reflex pyloric spasm, in 1920 we have it hotly debated as to whether there exists a period of initial hyperacidity which is gradually retired into what most authors regard as characteristic of cholelithiasis, a hypoacidity.

When speaking of gastric intubation, one must not forget to mention that much debated subject, duodenal drainage[11]. As far back as 1889 Boas attempted to obtain pure duodenal juice, but his tube and those of his contemporaries were cumbersome and it is extremely unlikely that they ever obtained duodenal juice in quantity without an admixture with the gastric secretions. It was not a feasible method until 1909, when Einhorn devised his duodenal tube and bucket. While this has undergone numerous variations, it remains esentially today what it was at the time of its invention, a small calibre rubber tube, to the end of which is attached a small metal perforated tip which is carried by means of peristalsis through the pylorus into the duodenum.

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[7] Garrison, F. H.: An Introduction to the History of Medicine, p. 657. Saunders Co., 1929.

[8] Ibid, p. 322.

[9] Ibid, p. 690.

[10] Graham, Christopher: Differential Diagnosis Between Duodenal Ulcer and Gallstone Diseases, Collected Papers Mayo Clinic, 1905-09, pp. 68175.

This method was further elaborated by Lyons[12] in 1919, when he discovered that the instillation of either a 5 per cent peptone solution or magnesium sulphate solution would cause the gallbladder to contract, with the consequent ability to obtain the bile by means of the duodenal tube. The last ten years have been replete with statistical studies, in which almost unbelievable diagnostic accuracy has been attained by means of this test with regard to the prediction of either inflammation or stones in the gallbladder. Suffice it to say, that this test has numerous adherents but the vast majority of gastroenterologists are content not to use it.

While few deny that a study of gastric content is of value in the differential diagnosis of the lesions of the upper abdomen, it was not until the development of roentgenology, and especially cholecystography, that cholelithiasis came to be an exact diagnosis. With the advent of roentgenography one of the first attempted applications was in the field of abdominal diagnosis. The first calculus demonstrated in the human body and proven by operation was in 1896. This was a renal stone, but it was not until two years later that a gallstone was demonstrated by means of roentgen rays. This was shown by Buxbaum of Karlsbad and followed a serious attempt to demonstrate gallstones in thirty different cases of gallbladder disease. This was scarcely less than one would expect to show, for several French authors had demonstrated by experiments on gallstones which had been removed, that by far the larger number were transparent to roentgen rays.

Beck of New York was the second investigator who had the good fortune to find gallstones in a living subject and prove that his findings were correct by subsequent operation. His paper was published in 1900 and much more widely read than that of Buxbaum. As a result, all owners of the then new roentgen-ray appliances began to look for gallstones with especial eagerness.

However, it was not until the discovery of the indirect signs of gallbladder disease by Schurmayer in 1910 that roentgenography began to play more than a very occasional role in the diagnosis of gallbladder disease. He was the first author to point out the frequency of adhesions between the gallbladder and the adjacent parts of the gastrointestinal tract and to note that the resulting deformities would be shown in a certain percentage of the cases by routine fluoroscopy of the stomach with an opaque meal. This was amply confirmed and elaborated by workers throughout the world.

In the next semidecade there were elaborated a large number of these indirect signs of biliary tract disease. Thus matters stood until the advent of the experiments of Abel and Rowntree, in which they demonstrated that the phenolphthalein compounds were largely excreted via the liver and bile. Graham and Cole conceived of the possibility that by preparing a compound of phenolphthalein which contained some inorganic elements to render it opaque to roentgen rays they might visualize the biliary tract. With this in mind they set to work and in 1923 they reported their success. Since then there has been much elaboration of and minor changes in their technic but their test has been repeatedly proven as the most reliable index we have as to the function of the gallbladder, beside the case history.

SYSTEMATIC REACTIONS FROM POLLEN INJECTIONS: THEIR CAUSES AND PREVENTION. George L. Waldbott, Detroit (*Journal A. M. A.*, May 30, 1931), presents evidence in support of the view that reactions from pollen injections are elicited by an excess of antigen absorption above the patient's individual tolerance. This effect may be produced by too fast absorption, such as an accidental intravenous injection, by the back-seepage of extract into a vein punctured accidentally, or by an overdose of antigen. Factors contributing to the effect of an overdose are: incomplete absorption of an injection given some time previously; absorption of additional pollen through the nose during the pollen season; absorption of substances other than pollen to which the patient is senitive. The clinical manifestations of pollen reactions appear to be identical with those of reactions from injections of horse serum. From the observation of patients one gains the impression that if the reaction is accelerated it manifests itself as a shock which is very close to, if not identical with, the anaphylactic shock in the experiment with the guinea-pig. If the reaction is not violent enough to cause an anaphylactic shock, allergic manifestations, such as asthma, are prolonged, localization of which is likely to be determined by the presence of antigen in the affected parts of the body.

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[11] Einhorn, Max: The Duodenal Tube, pp. 9-15. F. A. Davis & Co., Philadelphia, 1926.

[12] Lyons, B. B. V.: Choledochitis, Cholecystitis and Cholelithiasis. N. Y. Med Jour., July 3 and 10, 1920.

NORTHWEST MEDICINE
The Journal of the State Medical Associations of Oregon, Washington and Idaho
Devoted to the Interests of the Medical Profession of the Pacific Northwest
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EDITORIAL

THE PHILADELPHIA SESSION

The annual meeting of American Medical Association at Philadelphia last month was a notable gathering. This great association with over 100,000 members represents democratic medicine in the United States, with its medical educators, professors, instructors, investigators, city and county practitioners, specialists, naval and army surgeons and United States Public Health surgeons. These doctors came from every state in the union, Hawaii and the Isthmian Canal Zone. The Philadelphia meeting drew guests from China, India, Cuba, Korea, Japan, Porto Rico, Argentina, West Africa, Belgium, Holland, Persia, Scotland, Central America, England, Sweden, Venezuela, Canada and the Republic of Panama. Registration was over 7,500.

The following were registered from Oregon: W. W.Black, Harriet J. Lawrence, C. W. Moore, J. A. Pettit, G. C. Schauffler, R. E. Watkins, J. E. Weeks, all from Portland, and Wm. Kuykendall from Eugene. From Washington were registered the following: J. I. Durand, M. F. Dwyer, J. T. Mason, A. H. Peacock, A. U. Simpson, P. W. Wittis from Seattle; H. B. Luhn, J. H. O'Shea, R. F. E. Stier from Spokane; E. R. Tiffin from Enumclaw; W. B. Penney from Tacoma; C. E. B. Flagg from Vancouver; R. W. Brown from Vancouver; J. P. Loudon from Yakima.

The meeting could be divided into three parts; the legislative, conducted by the house of delegates and their various reference committees; the scientific section, consisting of essays, papers and addresses; and the exhibits, scientific and technical. One can only give a kaleidoscopic impression of the whole assembly. The House of Delegates and the reception of President Judd and President-elect Carey were held in the spacious Benjamin Franklin Hotel. The public meeting and welcome by the local officials were held in the historic Academy of Music. Here Dr. Judd delivered a keen, well punctuated address. The gist of his talk was to give the public more information on medical subjects, and maintain the intimate relationship between the physician and the patient.

The scientific session and the exhibits were held in the Philadelphia Civic Auditorium, a mammoth, handsome structure just completed and first used by this meeting. The sectional meetings were crowded to capacity. The papers and discussions were strictly limited and no lagging was allowed. Speakers had to have their ideas or messages in concrete form, as one symposium followed another. Most of these 300 papers will be published in the *Journal of the American Medical Association.*

The scientific exhibits showed months of work, presenting charts, drawings, roentgenography, tissue slides, mounted specimens, moving pictures, lectures and even fresh pathologic demonstrations. The technical exhibits had much to attract and allure. Modern office furniture, elaborate roentgenographic apparatus, microscope accessories, radio knives, rubber goods, diathermy apparatus, new instruments, fracture apparatus, medical books, journals, health foods, pharmaceutical preparations. These exhibits were an education in themselves.

The popularity and appeal of the A. M. A. meetings is constantly growing. One feels the need to break away from his practice for a breathing spell, and to see how the rest of the world is treating the sick. We come back with new ideas, new information and new inspirations. It should make us better doctors. The eighty-second annual meeting was a success, thanks to its able officers and the efficient arrangements committee.

THE SEATTLE NORTHWEST MEETING

The annual meetings of Pacific Northwest Medical Association have maintained a high standard of excellence during the period of the existence of the organization. It has become one of the outstanding sectional medical associations of the country and its meetings rank with other well-known medical organizations, second only to the American Medical Association. The leading men of the country, thus brought to the Northwest, through the papers and addresses which are presented confer noteworthy benefit to the medical profession of this section. It is noticeable that the personnel of the speakers on this program was for the most part composed of men of the younger generation. It indicates the passing of the older leaders of the medical profession and the advent of a younger group of men, filled with zeal for research work and keen to the new advances in the science of medicine.

The program for the meeting provided for general meetings in the morning, with the afternoon divided into medical, surgical and ophthalmologic sections. Naturally, the largest attendance was at these morning sessions, where many listened to the messages from Webster, Lewis, Austrian and Luckhardt. At the afternoon sessions large audiences greeted the addresses of Cunningham on the treatment of fractures. With his lucid explanations and demonstrations, it would appear that the most complicated fractures should now be handled with success by any surgeon who makes a careful study of these problems. It would be invidious to attempt to segregate the most important and instructive papers. Every one brought the latest information on his subject which was well worth the attention of all members of the profession.

The location for the meeting in the Olympic Hotel was ideal for such a gathering. The assembly rooms, isolated at one end of the hotel, offered a desirable suggestion of seclusion. The spacious lounge provided the best setting for the commercial exhibit which has appeared at any of these meetings. The number of exhibitors was characteristic of large medical meetings which are seen in other sections. An outstanding exhibit, which attracted universal attention, was the profusion of plaster models illustrating the treatment of various fractures which were assembled by Dr. Buckner of Seattle. It was a remarkable and instructive demonstration of treatment. Mention should also be made of the pathologic specimens presented by Drs. Else of Portland and Cefalu of Seattle, vividly portraying the details of pathology under consideration; and the colored moving pictures of thoracoplasty prepared by Dr. Oscar Proctor of Seattle. The absence of Dr. Fred Epplen on account of illness was universally regretted. He was a leading spirit in organizing this association and has been its secretary from the beginning.

The social getherings admirably served their purpose of bringing together members of the profession from all parts of the Northwest. There is no question that this section of the country presents features for a summer outing which are unrivaled in any other part of our country. Visiting doctors from the East are always enthusiastic over the natural features which cannot be duplicated in other sections. Meetings of this kind are of a most gratifying character and leave memories in the minds of the visiting as well as the resident physicians, which will be enduring for many years to come.

WASHINGTON ANNUAL MEETING

Washington State Medical Association will hold its annual meeting August 3-5 for the first time in the city of Aberdeen. The attached program of papers indicates the character of the scientific subjects which will be presented. It will be noted that most of the papers are prepared by members of the association. They cover a variety of topics that ought to prove of interest to all in attendance. The guests from out of the state are distinguished members of the profession, whom it will be a delight to honor and who will present papers of interest to all physicians.

The first day of the meeting will be devoted to the annual golf tournament at Grays Harbor Country Club with an informal dinner in the evening. Those who are fond of trap shooting will be able to satisfy their desire for this form of sport at Grays Harbor Gun Club. This event will be in charge of Dr. H. C. Watkins of Hoquiam. A number of trophies are offered which will make it interesting, not only for the expert but also for the mediocre shot. It is requested that those desiring to participate in this event will notify Dr. Watkins as soon as possible, so that the necessary arrangements may be made. Also on Monday, the ladies will have a golf tournament and luncheon at Highlands Golf Club. A sufficient number of trophies will be offered to attract the lady golfers. It is requested that all ladies desiring to play golf will notify Mrs. L. L. Goodnow of Aberdeen, who is in charge of these arrangements.

On Tuesday, the fourth, the visiting ladies will be taken to Pacific Beach, where they will be entertained at a bridge tea by wives of the members of Grays Harbor County Medical Society. In the evening those in attendance at the state association meeting will visit Pacific Beach, where they will all join the ladies in an informal sea food dinner. It is believed that this entertainment, together with the scientific program, will be of sufficient interest to make it worthwhile for a large attendance from the members of the association. This will be the first time that the organization has held a meeting on the shore of the Pacific Ocean. It will be a memorable occasion for all those who are able to be present.

PROGRAM

Tuesday, August 3

9:00 a.m. Meeting of House of Delegates and Board of Trustees, Morck Hotel.

10:00. Scientific Session. Lodge room, Elks' Building. President's Address, Dr. Arvid E. Anderson, President, Washington State Medical Association.

"Successful Treatment of Cerebral Hemorrhage in the Newborn" (motion pictures and lantern slides), Dr. Norman W. Clein, Seattle. Discussion, Dr. D. M. Dayton, Tacoma.

"Fractures of the Femur in Children, a Report of Seventy Cases" (motion pictures), Dr. C. F. Eikenbary, Seattle. Discussion, Dr. E. A. Rich, Tacoma.

"Galvanic Therapy," Dr. Clarence A. Smith, Seattle. Discussion, Dr. Joseph Aspray, Spokane.

"Diagnostic and Therapeutic Injections of the Sympathetic Nervous System," Dr. Paul G. Flothow, Seattle. Discussion, Dr. J. Tate Mason, Seattle.

12:10 p.m. Public Health League Luncheon, Morck Hotel.

1:30. "Sarcoma of the Alimentary Tract" (lantern slides), Dr. Leslie L. Nunn, Vancouver. Discussion, Dr. O. F. Lamson, Seattle.

"Rocky Mountain Spotted Fever; a Summary of Progress," Dr. E. E. Maxey, Aberdeen. Discussion, Dr. L. D. Fricks, U.S.P.H.S., Seattle.

"Chronic Pyuria in Children," Dr. Meredith F. Campbell, New York City. Discussion, Dr. A. L. Peacock, Seattle.

"Newer Methods of Fracture Treatment," Dr. Roger Anderson, Seattle. Discussion, Dr. Wm. A. Taylor, Ellensburg.

"Principles in the Therapy of Syphilis," Dr. Stephen Parker, Seattle. Discussion, Dr. H. Odland, Seattle.

6:30. Informal Dinner at Pacific Beach Hotel, Pacific Beach.

Wednesday, August 4

9:00 a.m. Meeting of the House of Delegates and Board of Trustees, Election of Officers, Morck Hotel.

10:00. Scientific Session. Lodge Room, Elks' Building.

"Head Injury in Relation to Otology" (motion pictures), Dr. Archibald W. Howe, Tacoma. Discussion, Drs. George Swift, and E. F. Chase, Seattle.

"Injuries of the Upper Extremity," Dr. Frederic J. Cotton, Boston. Discussion, Dr. I. R. Watkins, Aberdeen.

"The Field of Thoracic Surgery," Dr. Oscar S. Proctor, Seattle. Discussion, Dr. Frederick Slyfield, Seattle.

12:00. Luncheon.

1:30 p.m. "Proctologic Problems" (lantern slides), Dr. S. Tashian, Seattle. Discussion, Dr. Arthur Crookall, Seattle.

"Cardiovascular Problems of Every Day Medicine," Dr. E. John G. Beardsley, Philadelphia. Dicussion, Dr. George Miller, Seattle.

"Course of Gonorrhea as Recorded by Photomicrographs" (lantern slides), Dr. W. Ray Jones, Seattle. Discussion, Dr. William Ross, Tacoma.

"Intracranial Tumors" (lantern slides), Dr. Dorrell G. Dickerson, Seattle. Discussion, Dr. Conrad Jacobson, Seattle.

UNIVERSITY EXTENSION LECTURES

The University of Washington lectures, to be delivered in Seattle, July 13-17, offer a week of intensive study in certain specific courses that will repay all who may be able to take advantage of them. The detailed program appears on page 12 of the advertising section, where each lecturer is mentioned with the subjects he will discuss on each day. It is to be noted that provision is made for features that will fill all of five days. This offers a most attractive program. A large attendance is anticipated during this week.

MEDICAL NOTES

OREGON

Construction Contracts Approved. The Waverly Baby Home at Portland has recently let contracts to the extent of $100,000 for the purpose of a remodeling and new building program. The new structure will accommodate ninety youngsters and will provide an inner garden and play court.

Joint Meeting Held. The City and County Medical Society of Portland and the Oregon Social Hygiene Society were addressed January 3 by Dr. Walter Clarke on "Medical Measures in Social Hygiene." Dr. Clarke is associate director of the American Social Hygiene Association.

New Hospital for Seaview. Under the name of Ocean Beach Hospital, Miss Delia Lofgren is opening a private hospital in Seaview. Miss Lofgren as manager has been matron in charge of the Columbia Hospital at Astoria and has been a member of the State Hospital Board of Oregon for several years. Ambulance service is available and an efficient surgery is being equipped.

Unlicensed "Physiotherapist" in Difficulties. Emphasizing the need of vigorous control of schools and orphanages, is the news that in Portland Miss Lelah M. Nelson has been arrested. Investigation reveals that in her institution, the "Sun School," young children have been poorly cared for and allowed to reach an extreme degree of inanition and malnutrition. This has caused the humane society to intervene and bring the whole odious matter before the public.

Medical Assignment. Dr. T. N. Page of Portland has been assigned to service with the First Medical Regiment of the U. S. Army stationed at Carlisle Training School, Pennsylvania.

WASHINGTON

Washington Tuberculosis Association held its twenty-fifth anniversary meeting at Wenatchee June 11-13. An interesting program was presented before a large attendance of nurses and those interested in public health. Many phases of the tuberculosis problem were discussed. The guest speaker was Dr. J. A. Meyers of Minneapolis. A prominent feature of the meeting was the dinner on the evening of the twelfth, at which were four presidents of the six who have headed the organization during the past quarter century. Mrs. Buchanan has been the secretary during the life of the organization and has been the most active factor in the state-wide work which it has carried on.

Hospital Reorganized. Northwestern Hospital of Seattle has been for a number of years the only institution in the city open to patients of irregular practitioners. The old management has been changed and, under the new name, the Martha Washington Hospital, will be available for the use of all ethical physicians. It is a well equipped, six story, reinforced concrete building. It accommodates one hundred patients, is located on the first hill where nearly all the hospitals in the city are concentrated. It will be prepared to offer first class, satisfactory service.

Hospital Name Changed. The Bremerton City General Hospital has officially changed its name to Olympic Hospital, Incorporated. The purpose of the change is to correct the misunderstanding that it is a city owned and operated institution.

Hospital Staff Election. Dr. Albert Murphy has been reelected head of the staff of the Providence Hospital of Everett. Dr. John F. Purdy was elected vice-president and Dr. John Fiorino, secretary-treasurer.

New County Health Officer Appointed. Last month the Pierce County Board of Commissioners appointed Dr. Edgar F. Dodds of Tacoma, as county health officer in place of Dr. Hinton D. Jonez, who is chairman of the Republican state central committee. He has occupied this position for the past six years.

New Doctor at Penitentiary. Dr. R. M. Ritchey, recently from California, has been appointed physician and surgeon to the United States penitentiary at McNeil Island. He arrived last month to begin the duties of this office.

There Is Justice. Dr. E. M. Trevis, Tonasket physician, was forced to defend himself in alleged malpractice suit simply because he made an endeavor to collect his fee for surgical service in an accident case. He not only was victorious in the suit trumped up against him but also received a judgment against his patient for hospital and physician's fees.

New Trial Ordered. Information from Spokane indicates that the verdicts given Dr. William W. Robinson against a number of Spokane physicians has been set aside by Judge Barrett of Yakima. A new trial with all its odious reflections on the medical profession will doubtless soon be in full swing.

Eastside Medical Society met for its regular meeting May 28 at Kirkland. Speakers for the occasion were Drs. K. K. Sherwood of Redmond and R. J. McCurdy of Seattle.

Retiring Member Honored. Dr. Casper W. Sharples of Seattle, who has been a member of the school board for the past nine years, has retired from service after declining again to be a candidate. Last month a dinner in his honor was held at the Olympic Hotel, attended by more than two hundred citizens representing various lines of business and professional activities. It was a testimonial to the value of his services to the community. Speakers representing the school board, business and medical interests emphasized the value of his work as an educator and a physician. He has been a striking illustration of the valuable civic service which can be rendered the public by a physician in active practice.

Dr. E. Bradford Burwell has opened offices in Ballard and is limiting his work to eye, ear, nose and throat. He was formerly at the New York Eye and Ear Infirmary and has served with the coast guard in Alaska for four years.

Dr. Joseph Segal of Seattle has left for postgraduate work in Vienna for the next six months. On the way over he attended the American Medical Association convention at Philadelphia.

New Location. Dr. O. S. Starr has entered the practice of medicine at Winthrop. He has been practicing at Mabton for a number of years.

Dr. Donald Thorp has resigned as assistant medical director of the University of Washington to take up private practice in Seattle.

Dr. E. P. Murdock has recently left Winthrop for Boulder Dam, Colorado, where he is taking a position as government physician.

Dr. H. S. Foskett is leaving his practice in Pasco to locate in Ventura, Calif. Dr. C. W. May will succeed him in his work at Pasco.

Dr. Elizabeth Gunn has resigned as assistant medical director of the University of Washington to practice in Omak.

IDAHO

Southwestern Idaho District Medical Society. The regular monthly meeting was held at Boise May 28. The afternoon session consisted of a demonstration of selected cases at St. Luke's hospital. The evening session was addressed by Dr. Dillehunt of Portland, Ore., on "Osteomyelitis and Bone Tuberculosis." Dr. William A. Koelsch of Boise, president, presided. Dr. G. H. Wahle is secretary and treasurer.

Dr. Walter E. Whalen of Ogden, Utah, has opened offices in Pocatello. He is taking over the practice of Dr. Irwin.

Dr. G. H. Cooper has recently changed his location from Burley to Jerome.

OBITUARIES

Dr. Robert Inge Dalton, aged 90, of Seattle, Wash., died at his home Monday, May 25. He was born in Livingston, Alabama. At seventeen years of age he won a Naval Academy appointment through the influence of Jefferson Davis and served his midshipman training aboard the frigate, Old Ironsides. He took an active part in the Civil War. He was a graduate of the St, Louis College of Medicine and Science and has practiced in Seattle since 1903.

Dr. Loren Barlow, aged 35, formerly of Burley, Idaho, died Tuesday, June 4, in Phoenix, Arizona, of spinal meningitis. He was born in Bountiful, Utah. He graduated from Washington School of Medicine in 1926. He was attending school in the East when war broke out and served with the Marine corps for three years. Later he returned to his medical work and had recently settled in Phoenix.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the Auditorium of Medical-Dental Building, Seattle, June 1, with President McCurdy in the chair. About eighty members were present. Minutes of the meeting of May 4 were read and approved.

Dr. Treacy H. Duerfeldt of Tacoma gave an address on, "Asthma as an Allergic Disease." Asthma is usually an allergic disease or a manifestation of specific hypersensitiveness. This is indicated by positive skin reactions to certain foreign substances or allergins. The reaction of the allergin is indicated by the presence of the inciting substance in the sputum during attacks of the spasm. A careful history, with physical examination and skin tests, will classify the asthmatic attack as due to extrinsic or intrinsic factors. The treatment is specific only when the cause is a specific extrinsic factor. The paper was discussed by Drs. Watts, Slyfield and A. L. Jacobson.

Dr. Clarence W. Shannon read a paper on, "Workman's Fee Schedules of the United States and Other Countries." These fees in general are fairly satisfactory to the medical profession. Although less than in private practice, the doctor is more certain of his fee. Most states depend upon local medical societies for approval of fees and schedules. The low fees in this state are probably due to the fact that medical societies have taken little part in their compilation. The paper was discussed by Drs. Wurdemann and N. D. Miller.

A resolution was adopted that a committee be appointed to draw up a fee bill for recommendation to this society and transmission to the State Medical Association for further study and action. The Chair appointed Drs. H. V. Wurdemann, C. W. Shannon, H. E. Nichols, A. L. Jacobson, A. H. Peacock and W. A. Millington.

Names of delegates to the State Medical Association were read, with the suggestion that any members desiring matters to be presented at the state meeting should confer with the delegates. Dr. Peacock emphasized that the delegates should be instructed by the society.

Dr. G. J. P. Barger from the Belgian Congo, Africa, spoke on sleeping sickness, yaws, elephantiasis, leprosy and tuberculosis. He related some of his experiences as a medical missionary.

Drs. George W. Freeman and Paul S. Shigaya were elected to membership. The application of Dr. J. W. Doughty was read.

A regular meeting of the medical society was held June 8 with Dr. C. E. Watts in the chair.

Mr. Clyde C. Foley of Portland, executive secretary of the Oregon State Medical Society, addressed the meeting on the Oregon plan of organization of various medical groups, including the State Medical, Dental and Nurses societies.

Dr. Paul Whelan read a paper on, "The Problem of Gas in Stomach and Intestines." Factors to be considered in relation to flatulence are swallowing of air, slowing up of intestinal current, interference with prompt digestion of carbohydrates, intestinal absorption, intestinal circulation, the gas-carrying power of the blood and exhalation from the lungs. Belching, the most common complaint, may be of the active type resulting from swallowing air and its subsequent expulsion. It may be the passive type, when the stomach drops down and air is drawn into its cavity. Fermentation of food as a source of gas rarely occurs except in the colon. Interchange of gases between bowel and blood has been noted until a balance has been obtained. The paper was discussed by Drs. C. E. Hagyard and H. C. Olmstead.

Dr. M. W. McKinney read a paper on, "Medical and Surgical Prevention of the High Death Rate in Acute Appendicitis." The mortality for acute appendicitis is higher than ten years ago. The physicians' task is to reduce this by educating the layman as to the danger of the disease and the danger of delayed operation. In treatment of suppurative appendicitis the appendix should not be removed. Many cases have died as a result of peritonitis following a rupture of the abscessed wall. There is a distinction in the treatment of simple and gangrenous appendicitis. Cecostomy was recommended in these cases as a life-saving procedure. The paper was discussed by Drs. F. L. Horsfall and W. G. Hiltner.

Dr. G. E. Price read a paper on, "Borderline Mental Cases," which was discused by C. J. Rohwer.

TRI-COUNTY MEDICAL SOCIETY

The Tri-County Medical Society, composed of the county societies of Whatcom, Skagit and Snohomish, held its annual meeting at the Skagit County Golf and Country Club, June 12. A golf tournament comprised the afternoon entertainment. The cup was won by Snohomish county society. The Whatcom County Medical Society was host for the dinner which began at 7 p.m. A scientific session followed, at which the following program of papers was presented.

"Intraocular Foreign Bodies," Dr. S. S. Howe, Bellingham. Discussion led by Dr. C. L. Hoeffler, Everett.

"Extravasation of Urine," Dr. M. T. MacAlevia, Burlington. Discussion led by Dr. E. M. Adams, Everett.

"Nephritis," Dr. H. J. Greer, Stanwood. Discussion led by Dr. C. M. Hunter, Sedro-Woolley.

Dr. H. J. Whitacre of Tacoma made a few remarks concerning the future of medical practice. He said the people of America are receiving the best medical treatment available, but quackery still maintains its hold. This is due to lack of public education and cooperation amongst physicians. The whole country is complaining of the economic question as it affects us at the present time. As we cannot see into the future, it is necessary for the medical profession to do something to overcome the difficulties which may arise. In Tacoma they have organized a *"Physicians' and Dentists' Bureau, Incorporated,"* which has four bureaus: collection, health, telephone, nurses. Concerning state industrial cases, when a state case comes under the care of a physician, it is taken up with the Business Bureau. A Consultation Board then sees the case and record. The board then gives advice to the attending physician and sends its report to the employer, Department of Labor and Industries, also to the patient if necessary.

As the inclination at the present time is tending toward a policy of health insurance (either through state or private insurance companies), the physicians must organize harmoniously and cooperatively to be ready to talk business. Resolutions by societies are no good; we must have some basic principles. Concerning charity cases, the doctors should have some arrangement whereby they will be paid for cost of such cases.

This address was well received and a vote of thanks was tendered to Dr. Whitacre for coming up to give his excellent talk on this vital subject which concerns the whole medical profession of this state.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Heart Disease. By Paul Dudley White, M.D., Instructor in Medicine, Harvard Medical School; Physician, Massachusetts General Hospital, Boston. Cloth, 931 pp. $12.00. The Macmillan Company, New York, 1931.

This book, unlike Gaul, is divided into four parts. The first deals with physical examination and analysis of symptoms and signs; the second, with the etiologic types; the third, with organic cardiovascular disease; and the fourth, with disorders of cardiovascular function. The author rightly stresses the necessity of keeping etiology foremost in our minds, even more than the pathologic and functional changes, following the lead of Cabot. The description of physical examination of various parts of the body, other than the heart, in cardiac disease is excellent and brings out many important practical points not usually found in books of this kind. Under systolic murmurs the cause of the cardiorespiratory murmur is more clearly discussed than usual. The pulmonic systolic murmur is correctly regarded as physiologic, especially when the subject is in the recumbent position.

There is a very interesting and instructive chapter on cardiovascular roentgenology. The author points out the fact that pulsation is not always found in aortic aneurisms and the presence or absence of pulsation cannot be used in differentiating mediastinal tumors from aneurism. The general tone of the book strikes one as eminently sane and sensible, as in the discussion of treatment in cardiovascular syphilis. The author takes a very conservative view of the etiologic significance of focal infections. It would seem in this instance that it might be safe to emphasize the great value of their eradication in many cases of myocardial disease, even with congestive heart failure, where we have seen permanent cure following their removal, especially of infected teeth in the middle aged.

Myocardial disease, or so-called chronic myocarditis, is regarded as chiefly secondary to hypertensive and coronary disease. The author notes the incidence of a high diastolic pressure— even when the systolic pressure has fallen to nearly normal—as a means of determining the presence of hypertensive cardiac disease. As about one-quarter of the cases of myocardial disease (hypertrophy and dilatation) offer no solution of the etiology at autopsy, it would seem that there is still much to learn in this respect.

The sections on differential diagnosis in connection with various heart lesions are particularly praiseworthy, as also the introduction of original classic descriptions in the exact words of their authors concerning many cardiac disorders. Such quotations add dignity and authority to the book and keep alive the names and contributions of the truly great men in our profession.

The author calls attention to the fact that if one waits for marked cardiac hypertrophy, increased pulse pressure, water hammer and capillary pulse to make a diagnosis of aortic regurgitation, one will miss about half the cases. Coronary disease and angina pectoris receive particular attention, the section on angina being remarkably well done. The drawing showing the cardiac nerve connections, carrying afferent impulses that give rise to the sensation of cardiac pain, is of vital importance to the understanding of the cause of anginal pain and its relief by the modern method of injecting or severing the cervical and upper dorsal sympathetic ganglia. The writer, though extremely moderate and conservative, thinks that the present frequency of angina pectoris "is appalling and demands some action on our part." In marked contrast to present conditions he quotes Austin Flint's experience in a large practice of encountering no case of angina for one period of five years in New York City. He finds coronary disease in ninety-five per cent of angina patients and states that one-fourth of the cases show an apparently normal heart by all methods of examination, including electrocardiography.

The author presents a series of five hundred private cases of angina pectoris, from which he draws some valuable deductions. The duration of life in angina in mild and severe cases varies from five to ten years—a few individuals living as long as twenty-five years after the onset of the disease, which is a purely symptomatic disorder, based on disturbance of function, with or without evidence of organic disease. Coronary thrombosis causes death in about twenty-six per cent of the angina cases. In other angina deaths autopsy sheds no light on the cause and the author suggests in these cases of cardiac standstill that injection of epinephrine into the heart cavity might be a life-saving act. He affirms that angina attacks three males to every one female, but that Heberden noted only three female patients in one hundred cases of angina. The author attributes the present female incidence as due to their emergence from sheltered life. There is no question that hypertension and angina are much less fatal in women. The former has been pointed out by Fishberg and the latter by W. J. Mayo. The writer's comments on operatice treatment of angina are valuable on account of his personal experience.

All medical men interested in internal medicine are familiar with White's numerous and notable contributions to cardiology for many years. The present volume is by far the best clinical treatise on the heart in the English language today. While wholly scientific, it is also very practical and the average reader is not snowed under by electrocardiographic hieroglyphics. Winslow.

Practical Clinical Psychiatry for Students and Practitioners. By Edward A. Strecker, A.M., M.D., Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia, etc., and Franklin G. Efangh, A.B., M.D., Professor of Psychiatry, University of Colorado Medical School, etc. Third edition enlarged and revised. With forty-seven illustrations in the text. 553 pp. $4.00. P. Blakiston's Son & Co., Inc., Philadelphia, 1931.

Since Pinel's inaugural reform in the care of the mentally ill, there have been numerous advances in the field of psychiatry, yet many of the problems therein are as baffling as they were twenty-five years ago. Krapelin did much to clarify the subject by his clinical studies and classifications; in recent years attention has been directed to the physchologic approach and prevention as stressed by the mental hygiene movement.

In this third edition of their popular psychiatry, the authors have shown the modern trend by adding a new chapter on the practical aspects of child guidance problems,

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INDISPENSABLE USES OF NARCOTICS: CHEMISTRY OF BARBITAL AND ITS DERIVATIVES. George W. Collins and Paul Nicholas Leech, Chicago (*Journal A. M. A.*, May 30, 1931), believe that the increased use of hypnotics undoubtedly has been due in large measure to the zeal with which pharmaceutic houses vie with one another in introducing new, though not dissimilar, proprietary synthetics having sedative properties. Today, barbital and its derivatives are by far the most widely used. Yet it was scarcely a century ago that the first synthetic substance to be used as an hypnotic was prepared, namely, chloral hydrate. Liebig discussed its chemistry in 1832, but it was not until 1869 that Liebreich reported extensively on its pharmacologic action. Since then there have been many contributions to hypnotics before the present-day popularization of the barbital class. The authors present a brief and relatively nontechnical review of the chemistry of barbital and its derivatives. In order that the reader may easily visualize the relationship of the barbitals, there is appended here a chart showing the structural differences and their respective melting points. It will be noted that the compounds, chemically speaking, are probably more closely related than any other large group of essentially similar pharmaceuticals.

CALCIFICATION OF INTRARENAL ARTERIES GIVING ROENTGEN APPEARANCE OF CALCULI. George Winthrop Fish and Leonard A. Hallock, New York (*Journal A. M. A.*, June 6, 1931), report a case of calcification of the walls of the large intrarenal branches of the renal arteries in such a way that it gave the roentgenologic appearance of calculi or tuberculous calcification. Although calcification of this type has occasionally been noted at the postmortem table, so far as the authors have been able to determine there are no reports in the literature of a case similar to the one they observed and only a few vague references as to the possibility of its occurrence.

an interesting chapter of some sixty odd pages. Another chapter deals with the psychologic conception of mental disease and, while paying tribute to the contributions of the psychologic school, they follow this with the statement that "the physiologic theory insists that the brain is the organ of the mind and adheres to the logical conclusion (which results from this premise) that the final explanation of mental symptoms will be read in terms of brain pathology." This chapter contains eighteen pages. Only eleven and a half pages are allotted to the chapter on mental deficiency which, to the reviewer, seems insufficient for this important although unattractive subject.

The authors have not attempted to write an elaborate textbook, but have presented a short, concise outline of psychiatry. The method of illustrating the subject matter by means of selected case reports is well carried out. Throughout the book the aim is to bring psychiatry in closer relationship with internal medicine and the specialties and to emphasize a more careful study of all the possible predisposing and exciting etiologic factors of mental illness. A plea is made for the early recognition of potential mental troubles by the family doctor (rapidly becoming extinct), and for his handling of the early and mild psychotic cases. The book is readable, of a comfortable size, and is well and clearly printed. PRICE.

TRANSACTIONS, 1930, AMERICAN GASTROENTEROLOGICAL ASSOCIATION. Held at Atlantic City, N. J., May 5-6, 1930. 169 pp. $3.00. Paul B. Hoeber, Inc., New York, 1931.

This volume of Transactions presents an attractive, comprehensive view of many phases of this specialty. Dorst writes on, "Bacterial Hypersensitivity in Non-Ulcerative Colitis." This is another report on the work done by himself and associates on the investigation of this condition during the past seven years. The name is chosen inadequately to describe cases variously referred to as "irritable colon," "spastic colitis," "autointoxication," "enteric neurosis," etc. Search for a specific organism was unavailing, but it led to the discovery that the underlying factor in this condition was hypersensitivity of the entire tract to certain normal intestinal bacteria. This results in impaired colonic action with spasm, constipation and autointoxication. Treatment by desensitization gave good results, but greater benefit was obtained when this was combined with oral administration of sodium ricinoleate for the purpose of detoxification.

Duke discusses "Allergy as a Cause of Gastrointestinal Trouble." Certain foods are the usual inciting factor, but drugs, sera, insects and parasites must be considered. Elimination treatment or symptomatic administration of adrenalin, ephedrine, atropine and the salicylates may give brilliant results.

Graham interestingly reviews the history of the development of cholecystography. He refers to the fact that considerable retention of phenotetraiodophthalein indicates a poor surgical risk. Rest, with administration of carbohydrates, fluids and calcium soon turned a poor risk into a good one.

Lahey and Jordon believe that the management of biliary tract disease has been a joint problem of surgeon and internist. The object of careful study of all available data is to avoid unnecessaryoperations and delay, where surgery is indicated. Colonic dysfunction is the most common cause of confusion in diagnosis and of residual symptoms after cholecystectomy.

Leuders and Scherer studied the gastric contents in 100 cases of gallbladder disease and concluded that hyperacidity is found in acute diseases of the biliary tract and in uncomplicated cholelithiasis, while hypoacidity and achlorhydria are associated with chronic disease of the bilary tract. Sturgis and Isaacs present evidence supporting the theory that in pernicious anemia there is a fundamental and probably primary intrinsic defect in the gastrointestinal tract. In 150 cases of pernicious anemia, all had achlorhydria, probably preceding the anemia and cord changes and persisting after the anemia and other symptoms had improved. Sixty per cent had anorexia, 50 per cent nausea, 25 per cent abdominal pain, 29 per cent diarrhea, and 65 per cent glossitis. HAGYARD.

DIAGNOSTIC METHODS AND INTERPRETATIONS IN INTERNAL MEDICINE. By Samuel A. Loewenberg, M.D., F.A.C.P., Associate Professor of Medicine, Jefferson Medical College, etc. With 547 illustrations, some in colors. Second revised edition. 1032 pp. $10.00. F. A. Davis Co., Philadelphia, 1931.

The contents of this treatise adhere closely to their title. Almost a thousand pages are devoted to the presentation of carefully construed evaluation of diagnostic methods in internal medicine along with their clinical interpretations. Valuable charts depicting differential diagnosis are shown, as well as almost six hundred illustrations which the author has chosen with astuteness. The book has been written primarily as an aid for the general practitioner. There has been put forth an effort to view human ills from the standpoint of "the person affected by an illness" rather than "the illness affecting a person." The chapters on the thorax, examination and diseases of the respiratory system and the breasts, examination of the cardiovascular system, electrocardiography and tests for cardiac capacity, diseases of the abdominal viscera and interpretation of laboratory findings are especially well written. The book may be considered, particularly by the general practitioner, as one which is well worth having as an adjunct in medical diagnosis. BOWERS.

DIABETES: ITS TREATMENT BY INSULIN AND DIET. A Handbook for the Patient. By Orlando H. Petty, M.D., F.A.C.P., Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania, etc. With illustrations and tables. Fifth revised and enlarged edition. 224 pp. $2.00. F. A. Davis Company, Philadelphia, 1931.

The field for a book of this character is suggested by the publication of five editions since 1924. The author states that his main object is the education of the diabetic in all matters pertaining to health. Certain pages have been added with simple diets for the use of those following the orthodox dietary rules of Jewish faith. It is not intended as a substitute for the physician but as an aid in offering the patient a working knowledge of the management of this disease. There is a brief discussion of the diagnosis, cause and prevention of diabetes. The rest of the book is devoted to the subject of food and its preparation. Diets are suggested for various ages and conditions, including that for the toothless. Diabetic patients can peruse this volume with profit.

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THE THERAPEUTIC USE OF DIGITALIS*

Leon A. Goldsmith, M.D.
PORTLAND, ORE.

There seems to be at the present time a great deal of confusion in the minds of men using digitalis as to just when and in what quantities it should be employed. It was with this in mind that the recent literature on digitalis has been reviewed, and it is from these conclusions and from personal experience with the drug that we will discuss in a general way the when and the how much of the use of digitalis.

Withering was the first one to make a careful scientific study of digitalis in a monograph he published in 1786, after ten years use of the drug. In his conclusion he said, "Let the medication be given until it acts either on the stomach, kidneys or bowels, and let it be stopped on the appearance of any of these effects." He used the drug as a diuretic and overlooked its action on cardiac rhythm. In the next one hundred years no advance was made in the use of the drug and it had waves of popularity and disfavor, being used in various conditions for which it was not indicated.

Mackenzie, in 1911, and Lewis, in 1915, studied its effect on cardiac arhythmias, and through their work popularized the belief that it has its chief effect on auricular fibrillation and auricular flutter. Eggleston, in 1917, introduced a method of massive digitalization and popularized the large dose method. Pardee, in 1919, described elimination of digitalis and established the idea that it is eliminated at a rate of two grains a day and that this amount is required to keep the average patient digitalized.

We see that the outstanding names associated with digitalis have given us, briefly, the following conclusions: First, that the drug's chief value, and this has been interpreted by some to be its only value, is in the cardiac irregularities; second, that large dosage and complete digitalization is the object to be achieved; third, that digitalis in eliminated at a constant rate.

It will be the purpose of this paper to show that, while these ideas in part are correct, they are not the entire story of digitalis. The following ten points will be briefly discussed:

1. Digitalis is of value in regular rhythm.
2. Digitalis should be used in mild decompensation.
3. The pulse rate alone is not a determining factor, deciding whether or not digitalis should be used.
4. It should not be used in febrile conditions, with exceptions which will be discussed later.
5. It is not indicated in valvular disease without decompensation.
6. It is not contraindicated by hypertension.
7. Full digitalization is not always necessary.
8. Elimination is not in a fixed amount.

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* Read before a meeting of Portland City and County Medical Society, Portland, Ore., April 6, 1931.
* From the Department of Medicine, University of Oregon Medical School.

9. The degree of failure determines the degree of effective concentration required.

10. Small doses will produce effective concentration.

A few points on the pharmacology of the drug should be considered before further discussion. Digitalis acts, first, by slowing the heart through vagus stimulation; second, by causing increase of contractility; third, by impairment of conduction; fourth, by causing augmentation of inhibition. The increase of contractility increases its extent and the systolic pressure, and limits relaxation. The augmentation of inhibition increases relaxation and lowers diastolic pressure. There is no effect on slowing of conduction on the normal heart. Where conduction fibers are strained by abnormal increase in auricular rhythm or by malnutrition, the conduction mechanism is inhibited by digitalis so that this becomes one of its principal effects in the abnormal heart. Digitalis, then, slows the heart, first, through its vagus action; second, through its action on the inhibition of conduction in the abnormal heart. As the dosage is increased, it produces extrasystoles, and in poisoning doses, auricular and ventricular fibrillation. The irregular heart is slowed with digitalis but does not become regular until heart block intervenes. Then the heart is very slow and regular and becomes irregular again when toxic extrasystoles appear.

While digitalis has always been used to some extent in decompensation with regular rhythm, no careful study of its effect was made until 1922, when Luten[1] made a clinical study of this problem. He put decompensated cardiacs to bed, restricted their fluid intake, controlled their diet and observed how much they improved. The improvement was judged by loss of weight, positive fluid balance and improvement of symptomatology. When progress had stopped and the maximum amount of improvement from bed rest obtained, digitalis was administered. He found that about 60 per cent of the cases with regular rhythm showed definite improvement on digitalization after the previous control period.

Marvin,[2] in 1927, studied a similar group of cases and observed the additional factor of the etiology of decompensation. He found that there was practically no improvement in cases of decompensation with regular rhythm that were due to rheumatic endocarditis. He found that 50 per cent of the syphilitic cases improved temporarily and that 90 per cent of the arteriosclerotic or so-called hypertensive cardiovascular cases improved. In both of these studies the use of digitalis meant massive dosage with complete digitalization. Luten says, "the improvement in these cases is probably due to increased muscular efficiency brought about by the action of the drug on the heart muscle."

In rheumatic and syphilitic heart disease, the heart muscle is damaged and little or no response to muscle activity can be made. In these cases the amount of physical work done is not as important as the infection involved. In the arteriosclerotic type more effort is being made than the heart muscle can accommodate and an increase in the tone of the muscle improves the condition, because the muscle that is present is relatively healthy and can respond with increased contractility.

Since digitalis works as effectively as it does in decompensated cases of the arteriosclerotic type, it is the author's opinion that it should be of value in the mildly decompensated cases. That group of individuals who show breathlessness on exertion, cyanosis at times, easy fatigability, and in some cases rapid pulse and lowered blood presure, has been found to respond to small doses of digitalis with definite clinical improvement. In the group of cases under fifty who show these symptoms, and particularly if they have only easy fatigability and tachycardia, digitalis is usually not effective. In the groups past fifty, where there is arteriosclerosis with or without hypertension, it is found to be extremely effective.

In the groups of cases just discussed, and in fact in all cardiac cases, the pulse rate alone is not an indication for the use of digitalis. There may be decompensation with a slow pulse; there may be decompensation with a normal pulse; there may be decompensation with a rapid pulse; there may be a rapid pulse without decompensation, as seen in effort syndrome, the thyroid heart, or in fever, etc. When these cases are studied we see that a rapid pulse may be slowed by digitalis without improvement of the individual; we may see the patient with decompensation and slow pulse improve on digitalis; we may see clinical improvement without any change in the pulse; we also see the pulse slowed without improvement, and yet on further pushing of digitalis, improvement occurs; we will see that in such conditions as hemorrhage and shock not only is digitalis not indicated to slow a rapid pulse, but that it is actually harmful to the patient.

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[1] Luten, D.: Clinical Studies of Digitalis; Effects Produced by Administration of Massive Dosage to Patients wth Normal Mechanism. Arch. Int. Med., 33: 251-278, Feb., 1924.

[2] Marvis, H. M.: Digitals and Diuretics in Heart Failure with Regular Rhythm, with Especial Reference to Importance of Etiologic Classification of Heart Disease. J. Clin. Invest., 3:521-539, Feb., 1927.

Digitalis is not very effective in fever with two exceptions. In those cases of acute coronary closure, it is advisable not to use digitalis unless decompensation appears. In these cases there is fever, and if decompensation occurs, and by decompensation we mean evidence of congestive heart failure, then digitalis is indicated. Digitalis is also indicated in the treatment of bronchial pneumonia in old people, especially when there is previous cardiac pathology and evidence of previous cardiac failure. In acute rheumatic endocarditis with its associated febrile condition, digitalis does not effect the compensation. In children particularly it is contraindicated, as Schwartz[3] has reported, because during its use fiibrillation may ensue without warning symptoms of extrasystoles, nausea and vomiting. In these cases death occurs shortly after the fibrillation ensues.

The use of digitalis in pneumonia is a much mooted question. This problem has been very carefully studied by Wykoff[4] and his associates at Bellevue Hospital, using alternating cases, digitalizing one group and not digitalizing another. For every one hundred deaths in the control group there were one hundred and twenty-two deaths in the digitalized group. Study of the figures shows that the increased mortality varies with the age of the group.

INCREASED MORTALITY IN THE YOUNG GROUP

Age	Percentage of Mortality	Percentage of Mortality Increase
10-29	10.0	62.0
30-39	5.4	20.0
40-49	4.0	10.0
50 plus	7.8	13.5

In other febrile conditions digitalis is contraindicated because of its effect of diminishing cardiac output, which we will mention later.

Digitalis is not indicated in valvular lesions because of the valvular lesions themselves. In our opinion the stationary valvular lesion is not an indication for treatment with digitalis. The theoretical consideration mentioned in connection with fever also holds good here. The determining factor in deciding whether or not to treat with digitalis is the degree of compensation and cardiac reserve. In valvular lesions with compensation at minimal effort, in other words, those cases without cardiac reserve, digitalis is indicated to build it up by increasing the muscle tone. In those cases in which there is a fair cardiac reserve, digitalis is not indicated and may even prove harmful. As we see in almost every one of these conditions discussed, it is not the findings in the heart itself, but the degree of compensation as shown by the bodily circulation that determines the indication or the contraindication for the use of digitalis.

Hypertension is not a contraindication for the use of digitalis. Meyer and Mullen[5] made a study of the effects of digitalis on the blood pressure in decompensated cases and found it fell in 45.7 per cent of the cases upon restoration of compensation. Cushny considers this effect is due to the improved circulation to the brain which eliminates the vascular constriction that develops when there is a weak blood supply to the vasomotor center. We must consider that the blood pressure of the individual, as he presents himself for the first time, is a relative and not an absolute figure. A blood pressure of 180 systolic may represent an increase over normal or a diminution of the blood pressure for that particular individual, and digitalis, if the compensation is already broken, may in some instances increase the pressure level necessary to maintain efficient circulation in this particular individual, or it may, with the above mentioned mechanism, lower it when compensation is restored. So here, again, we see that the factor to be considered is the compensation and nothing else.

So far we have observed the "when" of the use of digitalis. Now we will consider the "how much." Gold[6] has made extensive studies which tend to disprove Pardee's idea that digitalis is eliminated in fixed quantities. He studied the laws of the elimination of the drug and found that there were two fractions; first, a rapidly eliminated fraction; and, second, a digitoxin-like fraction that has a cumulative action and may produce death as long as three to four days after administration. He has found that the rate of elimination varies with various preparations, and that repeated doses appear to sensitize to subsequent action of the drug and that perhaps this potentiation may account for some of the cumulative action.

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[3] Schwartz, S. P. and Weiss, M. M.: Digitalis Studies in Children with Heart Disease; Effects of Digitalis on Electrocardiograms of Children with Rheumatic Fever and Chronic Valvular Heart Disease. Am. J. Dis. Child., 38:699-714, Oct., 1929.

[4] Wyckoff, J., DuBois, E. F., and Woodruff, I. O.: Therapeutic Value of Digtalis in Pneumonia. J. A. M. A., 95:1243-1247, Oct. 25, 1930.

[5] Meyer, J. R. and Mullen, T. F.: Systolic Blood Pressure in Cardiac Decompensation and During Compensaton. Am. Heart J., 3:356-359, Feb., 1928.

[6] Gold, H., and DeGraff, A. C.: Studies on Digitalis in Ambulatory Cardiac Patients; Elimination of Digitalis in Man. J. Clin. Invest., 6:613-626, Feb., 1929.

Gold points out that it is important to standardize the drug from the point of view of elimination, a thing which at the present time is not done. In clinical cases he has established the fact that digitalis is not eliminated at a definite rate such as Pardee claimed, but that it is eliminated at a rate dependent on the amount of concentration in the body. He believes that, when the concentration is low, the elimination is slow and the drug accumulates. When a concentration sufficiently high is reached, then elimination may exceed administration, equal it, or be lower. In the latter case excessive accumulation occurs and toxic symptoms may supervene. This work, then, is our theoretical justification for small dose method and accounts for the fact that we see clinical improvement under the administration of doses of digitalis which, according to the old ideas of Eggleston and Pardee, could not give concentration great enough to be effective.

Eggleston popularized this idea of massive dosage to the extent that many men feel that digitalis is not of value unless pushed to the theoretical limit of concentration. It has been shown, however, particularly in cases with regular rhythm, that improvement has not occurred on this massive dosage, and that when the drug is discontinued, improvement will occur. This was thought to be a delayed digitalis reaction, but actually is due to the toxic effect of the drug on the heart, lowering its efficiency, and when through elimination the concentration is lowered and the heart is no longer toxic, the maximum digitalis effect is obtained.

Gold and DeGraff,[7] in studies of digitalis on ambulatory cardiac patients, laid down the following rules:

1. "In the average ambulatory cardiac patient there is a wide margin between the amount of the drug necessary to produce full therapeutic effects and the maximum amount that can be tolerated without toxic symptoms.

2. "The effective concentration of the drug within the body necessary to maintain full therapeutic results is usually much lower than that necessary to produce them in the beginning.

3. "The average ambulatory cardiac patient with auricular fibrillation can be satisfactorily digitalized by the daily repetition of a relatively small dose of the drug, which can then be continued for months or years as the daily maintenance dose without producing toxic symptoms.

4. "The degree of heart failure determines the effective concentration of digitalis in the body necessary to produce full therapeutic effects and the average ambulatory patient with symptoms of heart failure requires a much lower 'effective concentration' of the drug to attain this result than the average bedridden patient with far advanced congestive failure."

The above conclusions were reached through the discovery that one preparation of digitalis, which had been used interchangeably with another, was only 50 per cent as effective. Through this observation it was determined that a concentration greater than necessary was often being given. Gold feels that the greater the degree of heart failure, the greater the degree of concentration required to give clinical improvement. When toxic symptoms are produced by the drug before effective concentration is obtained, then the end of the road has been reached unless other drugs prove of value. It has also been found, particularly in old people where decompensation exists and an intercurrent fever intervenes, that a greater therapeutic dose is required to maintain concentration.

The question naturally arises, does the effective therapeutic dose give as much protection to the heart as complete digitalization? This question at the present time cannot be answered. Indirectly, an opinion can be formed from the work of Goldring, who noticed in some cases that there was no result from full digitalization but improvement occurred when some elimination had taken place. We see from the above considerations that complete digitalization is not necessary and effective digitalization can be reached by small doses.[8]

There has been a great deal of experimental work done on the use of digitalis. Cohen and Stewart[9] have studied the relation between cardiac size and cardiac output under digitalis, and have found that the heart is smaller and the minute output is less. Taintor and Dock[10] show that the action of digitalis causes constriction of the hepatic veins with storage of blood in the portal system and lowered stroke volume. These two pieces of experimental work show that, in a normal heart at least, digitalization lowers the cardiac output. This lowering of the cardiac output and accumulation of blood in the liver are the things that are to be combatted in shock and hemorrhage. It is from these considerations that we definitely state that digitalis is contraindicated in rapid pulse, resulting from hemorrhage and shock. Blumgart and Weiss[11] have shown that there is an increase in velocity in the venous flow and a diminishing pulmonary circulation under the effects of digitalis. Kinmoth[12] in England has shown that there is an increased stroke volume under digitalis therapy in the decompensated heart.

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[7] Ibid.: Studies on Digitalis in Ambulatory Cardiac Patients; Newer Principles of Digitalis Dosage. J. A. M. A., 95:1237-1243, Oct. 25, 1930.

[8] Ibid.: Studies on Digitalis in Ambulatory Cardiac Patients; Digitalization by Small Dose Method; Use of Digitalis in Children. J. A. M. A., 92:1421-1423, Apr. 27, 1929.

[9] Cohn, A. E. and Stewart, H. J.: Relation Between Cardiac Size and Cardiac Output per Minute Following Administration of Digitalis in Normal Dogs. J. Clin. Invest., 6:53-77, Aug., 1928.

[10] Dock, W. and Tainter, M. L.: Circulatory Changes after Full Therapeutic Doses of Digitalis, with Critical Discussion of Views on Cardac Output. J. Clin. Invest., 8:467-484, Apr., 1930.

Although much of the work done would indicate at first glance that digitalis is not a drug of choice in heart disease, clinical evidence shows that it is, and experimental evidence, when these experiments are done on abnormal hearts, also shows the value of digitalis. In conclusion, a review of literature and clinical experience indicates that both practical therapeutics and experimental data support the points outlined in the introduction.

CONCLUSIONS

1. Digitalis is of value in regular rhythm.
2. The pulse rate in a general way is not a guide to its use.
   - *a.* A rapid pulse alone does not indicate its use.
   - *b.* A slow pulse is not a contraindication.
3. Fever is a contraindication except:
   - *a.* In old people with previously failing heart.
   - *b.* In coronary disease with heart failure.
   - *c.* In increased dosage required when fever supervenes.
4. Hypertension is not a contraindication.
5. Valvular disease alone is not an indication.
6. Mild symptoms call for its use.
7. Full digitalization is not necessary.
8. Elimination is not in a fixed amount.
9. The degree of failure determines the degree of effective concentration required.
10. Small doses will produce effective concentration.

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[11] Weiss, S. and Blumgart, H. L.: Effect of Digitalis Bodies on Velocity of Blood Flow through Lungs and on Other Aspects of Circulation; Study of Normal Subjects and Patients with Cardiovascular Disease. J. Clin. Invest., 7:11-26, Apr., 1929.

[12] Kinimonth, H.: Circulation Rate in Some Pathological States with Observations on Effects of Digitalization. Quar. J. Med., 20:282-287, Mar., 1928.

CANCER OF THE LARGE BOWEL*

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From an embroyologic and physiologic standpoint, the alimentary tract separates itself into three divisions. The first portion extends down to the mid-duodenum, the second to the proximal transverse colon and the third to the anal ring. Each division is quite sharply segregated as to function, and to blood and lymphatic supply, and correspondingly we find that their susceptibilities and reactions to pathologic processes are quite as sharply demarcated.

With this fact in view, a series of fifty-two cases of carcinoma, involving the left colon and rectum, that is the hind-gut, have been collected for study because their symptomatology, course and problems involved in treatment are quite uniform. Carcinomata of the cecum and of the anal ring have not been included because their pathology and symptomatology are quite different, and the problems they present have little in common with the other group.

The fifty-two cases here presented were all treated by me during the decade from 1920 to 1930. I have been able to follow them all since the operation, and the living patients have all been examined by me during the past year. It is for this reason that I have felt justified in making and reporting a study of such a small group.

These cases present a singularly uniform pathologic picture. All were adenocarcinomata. The microscopic sections showed a not very high grade of malignancy. Most of them started near the mesenteric attachment, were of slow growth, were prone to ulcerate and develop much fibrous tissue and tended to become annular quite early. Correspondingly the symptoms and clinical course were quite uniform.

To set down accurately in sequence, however, a chain of symptoms is quite impossible, particularly if one desires to emphasize the earlier manifestations of the disease. However, the very first symptoms are the result of the tendency of the growth to produce obstruction. This is nearly always manifested by a change in the patient's bowel habits. Unfortunately this is frequently of so slight a nature as to excite no alarm on the part of the patient, and is only brought out later by close questioning. Borborygmus, increased flatulence, and a vague sense of distress in the lower abdomen are usually present for several months before constipation becomes sufficiently obstinate to cause concern. Often alternating attacks of diarrhea and constipation first draw the patient's attention to his bowel.

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Next in point of time is the appearance of blood in the stool. In carcinoma involving the lower sigmoid and rectum this may be the first symptom the patient notices, though in rectal carcinoma tenesmus may antedate the appearance of blood. Pain, aenemia, cachexia and loss of flesh are all late symptoms and should never be considered in arriving at an early diagnosis. Early diagnosis, indeed, must depend entirely on the results of the examination. The early symptoms here related should only serve to arouse the suspicions of the alert surgeon and spur him to carry out routinely a complete examination.

Of all the methods of examination, the most useful to me has been the barium enema. The enema far exceeds in value the barium meal. Under the fluoroscope one can see the column of barium suddenly halt. Then a definite canalization of the lumen with rough jagged contours of the margins is visualized. This can be often demonstrated when the barium meal shows no abnormality. At a later stage the barium meal becomes a positive menace, since it may be the means of actually producing an acute obstruction. Most carcinomata of the rectum can be palpated by the finger and the presence of hemorrhoids should never cause us to neglect exploring the rectum farther up. The routine use of the sigmoidoscope should always be employed.

Next to making an early diagnosis, the importance of which we all recognize, is the necessity of recognizing the role played by obstruction. Practically, I believe that we never encounter a case so early that obstruction has not already set in, though there may be clinically little or no evidence of it; obstruction not only as it affects the bowel contents, but more particularly the bowel wall. Swelling, passive congestion, edema and permeation of the tissues with microorganisms set in early and are constantly present until the obstruction is relieved. Septic peritonitis, the result of giving way of sutures, is still the chief cause of operative mortality in spite of improved methods in operative technic.

It was to get away from the fearful mortality following the one-stage resection that Mikulicz devised his two-stage resection. Increasing dissatisfaction with the results of this operation has caused me to abandon it as a routine procedure. Its fault I believe is in that it does not allow the tissues to recover sufficiently from the effects of obstruction. During the past five years I have followed a definite routine program which has yielded such a high percentage of good results that I have come to adopt it as standard for all growths from the transverse colon to the lower third of the sigmoid.

Every case, no matter how early it may be seen, is first subjected to a cecostomy. This is usually done under local anesthesia. Even the most debilitated and toxic patient can stand this without serious reaction. Sufficient time is then allowed to elapse for all effects of obstruction to subside and the patient gotten into an optimal condition for the major operation. This I consider the most important part of the procedure. At least two weeks should elapse between the first and second stages and even a longer time may be used to advantage. It is a fatal mistake to hurry the second stage.

When the patient has been gotten into the best possible condition (and to determine this the laboratory examination of urine and blood is of even more importance than the physical appearance of the patient), the formal resection is undertaken. This consists in the excision of the involved area, together with the regional lymphatics, followed by an end-to-end suture of the bowel. For this stage I have found spinal anesthesia more satisfactory than any form of general anesthetic. Shock is less and the operation itself made much easier. As a rule in ten days the cecostomy can be closed. This is always a very simple affair. Much simpler than the closing of the double-barrelled gut of the Mikulicz resection. Indeed, once I have seen a cecostomy close spontaneously.

A minor technical detail of the cecostomy may be of interest. Formerly subcutaneous suppuration about the fistula was a very annoying complication which frequently prolonged convalescence. This is always due to sutures which have inadvertently pierced the bowel wall and allowed infection to travel out into the surrounding tissues. This is overcome by holding the bowel up with a clamp which is put on in the longitudinal axis of the bowel and flush with the skin. The abdominal wall is closed snugly about the bowel, but no sutures touch the bowel wall. The skin wound is closed with clips. The clamp is taken off in two or three days, depending on the condition of the patient. Often pressure of gas blows the bowel open or if not, it can be easily opened with a forcep. The use of a cautery is not necessary.

Experience with these cases has lead me to conclude that the idications for radical operation should be considerably extended. Only an irrecoverably toxic condition of the patient or direct involvement of surrounding structures by the growth, so as to make resection technically impossible, are absolute contraindications. Even the presence of wide spread metastases is not a contraindication, if the condition of the growth permits of resection. I have had patients live as long as four and a half years in good health when metastases even as far as the liver were demonstrated at operation. And in none has intestinal obstruction appeared during life, no matter how extensive or massive the carcinomatous masses later became.

With growths involving the lower sigmoid and rectum the observations that have just been made as to the effects of obstruction on the tissues of the bowel wall hold true and if possible even to a greater degree. There is also another absolute condition which we here encounter, due to the peculiar anatomic situation of the structures involved. In the present state of our surgical knowledge there is no procedure contemplating a reestablishment of the continuity of the bowel canal that holds out any prospect of a radical cure. This I believe, at the present time, to be absolute. And it is unfortunate that it is so, for I believe that there is no one thing that drives patients away from surgery at a time when it would be of lasting benefit to them as the thought of living thereafter with a permanent colostomy. Many times I have had patients flatly refuse operation and leave me when they had this explained to them. Nor could I very much blame them for, if I were asked what anatomic structure contributes most to the sum of human happiness, I should answer the sphincter ani.

Because of this, in years past I have tried most of the methods which have been proposed for resecting the gut, bringing the sigmoid down and uniting it to the stump of the rectum, but always with unhappy results. And so I have come to a fairly routine procedure of making first a permanent inguinal colostomy, followed in two or three weeks by a posterior resection.

Most of the two-stage abdominoperineal resections that have been proposed in recent years are open to the objection that they require too much surgery in the first stage, when the bowel is crippled by edema and congestion, thus inviting infection.

Recently Lahey has proposed to overcome this by dividing the sigmoid and mesosigmoid down to its attachment in the first stage, bringing the proximal segment out through an inguinal colostomy wound and suturing the top of the distal segment to the lower end of the median incision. Later he dissects out the distal sigmoid, frees it down to the level of the coccyx, closes the peritoneum at the bottom of the pelvis and brings the liberated gut out through a perineal incision. This obviates the objection of doing too much at the first stage and should, therefore, have a small primary mortality. Lahey also claims that he gets a better functioning colostomy than a lateral colostomy gives because he does not have a blind loop of sigmoid. I have recently done this operation twice, but I did not see that I got any better results than I had previously obtained. A well placed lateral colostomy can be just as satisfactorily cared for and I have never seen any bad effects from the blind loop of sigmoid.

It seems to me that this method will find its most useful field in the treatment of the inoperable cancer of the rectum. A straight tube leading from the suprapubic region to the anus should lend itself very favorably to the application of radium.

While the subject of this paper does not include inoperable cancer, I may be allowed to digress sufficiently to say that my experience does not make me very optimistic over the results of radium therapy. From time to time one sees accounts in the literature of apparently inoperable cancers of the rectum, which after colostomy and radium have so far improved as to permit of a radical resection. In my own experience I have seen no more improvement after a colostomy followed by radium than I have seen follow a colostomy without it.

SUMMARY

In the fifty-two cases included in this series, there was a primary mortality of eight, which included all the deaths in the hospital. Of these three were due to causes always liable to develop in patients of the cancer age. In five the cause of death is put down as septic peritonitis, in other words, an infection due to the giving way of sutures. These deaths were due to the fundamental mistake of not sufficiently recognizing the damaging effect of obstruction on the walls of the bowel. Improved technic should materially reduce this danger. Of the forty-four able to leave the hospital, twenty-four have since died and twenty are living. Of the twenty-four subsequent deaths, in fifteen there were definite and well marked evidence of recurrence. One died four and a half years after

TOTAL NUMBER OF CASES TREATED BY RADICAL RESECTION BETWEEN 1920 AND 1930—32

Operative deaths	Subsequent deaths	Living
8	24	20

OPERATIVE DEATHS—8

Name	Location of growth	Cause of death
Mrs. R.	Rectum	Septic peritonitis
Mrs. S.	Rectum	Cerebral hemorrhage
Mrs. W	Transverse colon	Septic peritonitis
Mr. J	Sigmoid	Uremia
Mrs. C	Splenic flexure	Septic peritonitis
Miss B	Sigmoid	Septic peritonitis
Mr. T	Rectum	Septic peritonitis
Mr. B	Splenic flexure	Uremia

SUBSEQUENT DEATHS—24

Name	Locat. of growth	Years after Operat.	Cause of death
Mrs. A	Rectum	4	Recurrence
Mrs. M	Rectum	5	Recurrence
Mr. B	Sigmoid	6	Recurrence
Mrs. J	Sigmoid	3	Recurrence
Miss R	Rectum	4½	Recurrence
Mr. A	Splenic flexure	3	Recurrence
Mrs. S	Rectum	4	Recurrence
Mr. P	Hepatic flexure	2½	Recurrence
Mr. W	Descend. colon	2	Recurrence
Mr. S	Rectum	5	Recurrence
Mrs. L	Sigmoid	4	Recurrence
Mr. R	Sigmoid	3	Recurrence
Mrs. N	Rectum	2	Recurrence
Mrs. H	Splenic flexure	2	Recurrence
Mr. L	Rectum	2	Recurrence
Mr. T	Sigmoid	3	Recurrence
Mrs. C	Splenic flexure	4½	Metastasis
Mr. B	Rectum	6	Automobile accident
Mr. K	Descend. colon	5	Cardiorenal disease
Mrs. M	Sigmoid	4	Diabetes
Mr. R	Rectum	4½	Cerebral hemorrhage
Mrs. H	Sigmoid	1	Acute intest. obstruction
Mr. M	Transv. colon	3	Pneumonia
Miss E	Rectum	2½	Cardiorenal disease

LIVING—20

Name	Locat. of growth	Years since operat.	Present Health
Mr. P	Rectum	6	Well, clin. free from Ca.
Mrs. J	Rectum	5	Well, clin. free from Ca.
Mr. C	Sigmoid	5	Well, clin. free from Ca.
Mr. H	Rectum	6	Well, clin. free from Ca.
Mr. A	Sigmoid	4	Well, clin. free from Ca.
Mr. O	Rectum	4½	Well, clin. free from Ca.
Mr. S	Rectum	5	Well, clin. free from Ca.
Miss S	Sigmoid	5	Well, clin. free from Ca.
Mrs. A	Rectum	3	Well, clin. free from Ca.
Mr. M	Descend colon	3½	Well, clin. free from Ca.
Mrs. P	Transv. colon	4	Well, clin. free from Ca.
Mr. L	Rectum	2½	Well, clin. free from Ca.
Mr. J	Sigmoid	2	Well, clin. free from Ca.
Mr. C	Transv. colon	1	Well, clin. free from Ca.
Mr. T	Sigmoid	1	Well, clin. free from Ca.
Mr. S	Rectum	1	Well, clin. free from Ca.
Mr. N	Sigmoid	5	Poor, cardiac asthma
Mrs. L	Splenic flexure	7	Poor, retroperitoneal tum'r
Mr. S	Transv. colon	2	Well, has metatasis
Mrs. McK	Splenic flexure	1	Well, has metatasis
Mr. F.	Transverse	1	Poor, metatasis in spine

the operation of metastases which were present at the time of operation. Eight died of other causes and, as I was in rather close touch with all of them, I feel justified in stating that recurrence had not occurred in any.

Of the twenty patients still living, fifteen are quite well and so far as an ordinary physical examination can determine they are free from recurrence. Two more are in good health, but I know they have cancer because metastases were found at operation one and two years previously. Three are in very poor health. Two I am sure have recurrence. In one I suspect recurrence, but have not been able to demonstrate it.

CONCLUSIONS

In presenting the summary of these fifty-two cases, I would not presume to draw any statistical conclusions from such a small number of cases, but it is thought that the complete postoperative history furnishes grounds for drawing the following conclusions:

1. An appreciation of the role that obstruction plays is of the greatest importance in planning a line of treatment in these cases.

2. In cancer of the lower sigmoid and rectum no operation can offer a prospect of permanent cure that does not contemplate a permanent colostomy.

3. The indications for radial resection should be extended considerably beyond what we have heretofore thought.

4. Spinal anesthesia is peculiarly adaptable in operating on most of these cases.

PERENNIAL POLLEN DESENSITIZATION. Warren T. Vaughan, Richmond, Va. (*Journal A. M. A.*, July 11, 1931), describes the technic of perennial pollen desensitization and enumerates its advantages thus: 1. Intensive preseasonal treatment is avoided. The patient is not restricted to one locality for a month or more for treatment prior to the season. 2. As far as allergy is concerned, the patient's general health throughout the year appears to be better, at least in certain cases. Ragweed allergen extract acts specifically against ragweed pollen inhalation and nonspecifically, either in increasing the tolerance to other allergens or in lessening the vagotonic response. 3. There appears to be a decreased tendency toward unfavorable reactions. One can scarcely say that they cannot occur, but if they do they are more likely to be due to faulty administration, such as the penetration of a small venule. 4. Treatment may be started at any time of the year. This enables the physician to avoid bunching his patients during the pollen season and having scarcely any work to do in this line at other times. 5. Another advantage is that there is more available time in which to accomplish complete desensitization in the rare extremely sensitive case requiring minute increases each time. Here "rush" desensitization is impossible. 6. There is some evidence that leads one to hope that if perennial desensitization is continued long enough an actual permanent cure may be effected.

TRIGEMINAL NEURALGIA[*]

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Trigeminal neuralgia was described in the early part of the eleventh century by Avicenni, the Arabian physician, who used the term "tortua oris." Fothergil wrote an excellent description of it in 1773, since which time there has been very little added to our knowledge of its etiology. It was thought to involve both the fifth and seventh nerves until 1820, when Sir Charles Bell worked out the functions of these nerves.

Anatomy and embryology. In some of the lower animals the ophthalmic and the maxillomandibular branches are separate nerves. In man the sensory fibers of these branches develop as separate nerves and later fuse, although in the brain stem they remain as separate bundles.

Until comparatively recently all the severe painful lesions of the side of the face were grouped under the term trigeminal neuralgia. After the beginning of operative treatment for this malady, it was found that many patients were not relieved by the section of the sensory root. Careful study of those patients not relieved revealed the fact that they did not have a typical trigeminal neuralgia. It was also observed that some patients diagnosed as having trigeminal neuralgia were relieved by mastoid and sinus operations. A careful study of these patients also showed that they had an atypical type. This has led to the differentiation of the condition formerly grouped under the term trigeminal neuralgia into true trigeminal neuralgia and atypical or pseudotrigeminal neuralgia.

True trigeminal neuralgia is a disease of unknown etiology, doubtful pathology, characterized by paroxysmal pain referred along the trunks of the trigeminal nerve to the terminal branches, the irritation of which may produce paroxysms. These are known as trigger areas. The onset of an attack is usually sudden, and at first the duration is short but later may become more prolonged. The attacks are accompanied by muscular contraction. The interval between attacks may be a few moments, a few weeks or a few months. The attacks come on without warning and apparently without cause. During an attack a spasm may be brought on by a very slight irritation, such as touching the face even with a soft cloth, eating, drinking, or even a slight cool breeze.

The maxillary branch is most frequently involved; next is the mandibular, and least the ophthalmic. While pain may be referred to the ophthalmic branch, there are probably not more than 1 or 2 per cent in which the fibers of this branch are involved.

Frazier[1] in the study of a large series, laid great stress on the type of symptoms, dividing them into three main types: (1) pain, sharp, cutting or stabbing; (2) pressure, boring, grinding or squeezing in nature; and (3) thermodisturbances, burning, throbbing or stinging. The pain travels parallel along the branch, never cross-wise, and is always referred to the terminal branches of the nerve trunks. The course of the disease is progressive and, while there may be frequent intervals of relief of varied lengths, it is rarely cured except by section of the sensory trunk.

The psuedotrigeminal neuralgia, in contradistinction to the true, has a different type of pain which does not correspond in its distribution to any of the main branches of the fifth nerve and it never runs in the direction of the main branches. It usually does not have trigger areas, where irritation may excite attacks and, when these are present, they are not found in the vicinity of the distribution of the terminal branches of the fifth nerve. Pseudotrigeminal neuralgia is a generic term which includes several independent and distinct diseases.

PSEUDOTRIGEMINAL NEURALGIA

1. *Sphenopalatine neuralgia* is the best known of the group. Sluder[2] first described this condition and recently Fenton and Larsel[3] have shown how pain originating from the sphinopalatine ganglion may be referred to the ear. Sluder described this condi-

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[*] Read before Southern Oregon District Medical Society, Medford, Ore., May 12, 1931.

[1] Frazier, C. H.: A Clinical Lecture on Trigeminal Neuralgia. Surg. Clin. N. A., 1:101, 1921; Neuralgias of Trigeminal Tract and Facial Neuralgias of Other Origin, Impressions Derived from a Survey of 555 Cases, Ann. Otol. Rhinol. and Laryngol, 30:855, 1921; Pain Phenomena of Face, Their Origin and Treatment, with Special Reference to Trigeminal Neuralgia, Am. J. M. Sc., 169:469, 1925; Subtotal Resection of Sensory Root for Relief of Major Trigeminal Neuralgia, Arch, Neurol. and Psychiat., 13-378, 1925; The Surgical Treatment of Trigeminal Neuralgia, Surg. Clin. N. A., 5:1521, 1925.

Frazier, C. H. and Russell, E. C.: Neuralgia of Face; Analysis of 754 Cases with Relation to Pain and Other Sensory Phenomena Before and After Operation, Arch. Neurol. and Psychiat., 11:557, 1924.

Frazier, C. H. and Gardner, W. J.; The Radical Operation for the Relief of Trigeminal Neuralgia., S. G. and O., 47:73, 1928.

[2] Sluder, G.: The Role of the Sphenopalatine (Meckel's) Ganglion in Nasal Headache, N. Y. M. J., 87:989, 1908; Lower Half Headache (Neuralgia) of Nasal Origin, J. A. M. A., 78:1898, 1922.

[3] Fenton, Ralph A. and Larsell, Olaf: The Embryology and Neurohistology of Sphenopalatine Ganglion Connections; a Contribution to the Study of Otolgia. Trans. of Am. Otol. Soc. 1928.

tion as having pain involving the face from the eye downward and extending backward to the mastoid region, where there was a tender spot about 5 cm. behind the ear. Severe earache may be present. The pain sometimes extends out to the shoulder and down the arm to the finger or around the back of the neck. The pain is not paroxysmal and not brought on by pressusre over any of the trigger zones of the fifth nerve. It is often accompanied by irritation of the nasal mucosa, lacrimination, and sometimes photophobia and disturbed sense of taste. It is to be differentiated from the true trigeminal neuralgia by its atypical nature, failure to conform to the distribution of the fifth nerve, lack of trigger zones. and, according to Sluder, by relief with the cocainization of the sphenopalatine ganglion.

2. *Geniculate ganglion neuralgia.* Hunt[4], in 1907, reported a case of herpes zoster of the geniculate ganglion with sereve otalgia and herpetic eruption in the external auditory meatus. It is apparently quite rare.

3. *Myositis.* Stookey[5] reports having seen a group of cases closely simulating trigeminal neuralgia, due to a myositis of either the temporal or masseter muscles. The pain is usually burning in character and often paroxysmal. The muscles are swollen and there is a very tender area at the center of the involvement. It is relieved by heat and massage.

4. *Herpes zoster of the gasserian ganglion.* This is usually limited to the ophthalmic branch and is accompanied by a sharp continuous pain and the evidence of herpetic eruption on the skin. It is never paroxysmal.

5. *Intracranial tumors.* Pressure upon or involvement of the gasserian ganglion by tumors may produce pain that sometimes very closely simulates trigeminal neuralgia. Stookey believes the cerebellopontine tumor to be the most frequent one to produce symptoms referred to the trigeminal area. It is differentiated by the signs characteristic of this tumor. Peet[6] collected sixty-five tumors involving the gasserian ganglion directly or indirectly that produced pain resembling trigeminal neuralgia. The most frequent one was meningioma, but glioma, neuroblastoma, carcinoma and chondroma were included in the list.

Treatment. Only two methods of treatment give any measure of relief, alcoholic injection and operation. Alcoholic injections may be given (1) at the foramen of outlet of the terminal branches, (2) in the main trunks as they come through the foramen of the skull, or (3) into the gasserian ganglion. Injection into the gasserian ganglion gives the best results but is most difficult and carries with it an element of danger. Injections into the maxillary and mandibular branches in the foramina through which they leave the skull has proved the most satisfactory form of alcoholic injections.

These are somewhat difficult and give relief usually only for a matter of months, rarely as long as two years, although there are reported cases of four years and even more. The average period of relief is less than a year for the first injection and with each subsequent injection it usually becomes shorter until there often comes a time when alcohol injections are no longer effective. This is probably due to a sclerosis of tissue so that the alcohol does not penetrate the nerve fibers in the later injections. Alcohol injections in the external foramen are the easiest to do but often fail to relieve and the duration of the relief is shorter.

On the whole, alcoholic injections for trigeminal neuralgia must be looked upon as a palliative and not a curative measure. Stookey[7] refers to this form of treatment as one of the "archaic methods frequently adhered to by the profession at large long after they have been proved obsolete by those working more intensively in a particular field," though there are exceptional instances where it is indicated.

Operation. In 1886 Sir Victor Horsley[8] first attempted operative relief. His operation was not successful. Rose[9] removed a portion of the superior maxilla, opening the skull at the foramen ovali and removed the gasserian ganglion. Andrews[10] went in through the pterygoid and removed the gasserian ganglion. In 1892 Hartley[11] and Krause[12] in-

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[4] Hunt, J. R.: Herpetic Inflammations of the Geniculate Ganglion, Nerv. and Ment. Dis., 34:73, 1907.

[5] Stookey, Byron: Nelson Loose Leaf Living Surgery, 2:550.

[6] Peet, M. M.: Tumors of the Gasserian Ganglion with Report of Two Cases of Extracranial Carcinoma Infiltrating the Ganglion by Direct Extension Through the Maxillary Division, S. G. O., 44:202, 1927.

[7] Stookey, Byron: Differential Section of the Trigeminal Root in the Surgical Treatment of Trigeminal Neuralgia. Ann. Surg., 87:172, 1928.

[8] Horsley, Victor: An Address on the Surgical Treatment of Trigeminal Neuralgia. Practitioner, 65:251, 1900.

[9] Rose, W.: Removal of the Gasserian Ganglion for Severe Neuralgia. Trans. of Med. Soc. London, 14:35, 1891.

[10] Andrews, E. Wyllis: Quoted by Kanavel and Davis, Surgical Anatomy of the Trigeminal Nerve. S. G. and O., 34:357, 1922.

[11] Hartley, F.: Intracranial Neurectomy of the Second and Third Divisions of the Fifth Nerve. N. Y. Med. Jour., 55:317, 1892.

[12] Krause, F.: Entfernung Des. Gang. gasseri und des central dabon gelegner Trigeminusstammes Deut. Med. Wchnschr., 19:341. 1893.

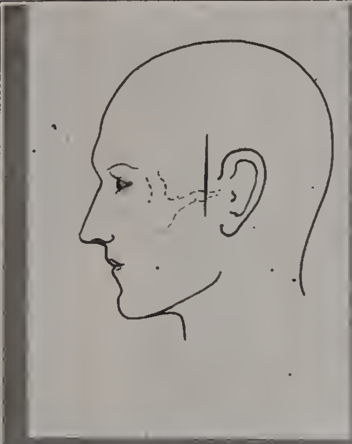
Fig. 1

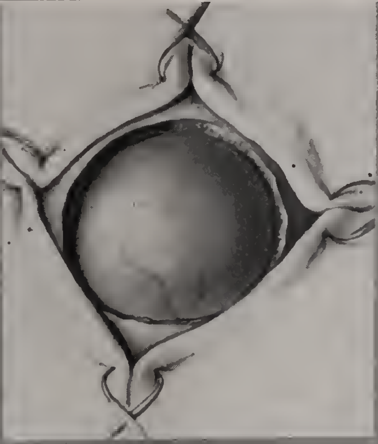
Fig. 2

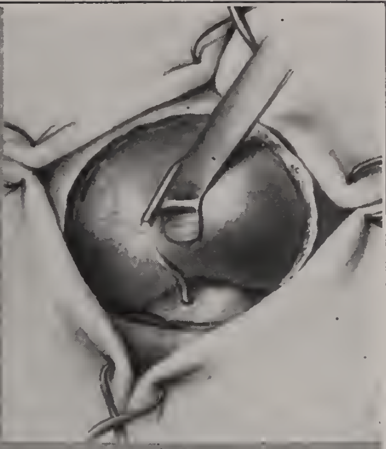
Fig. 3

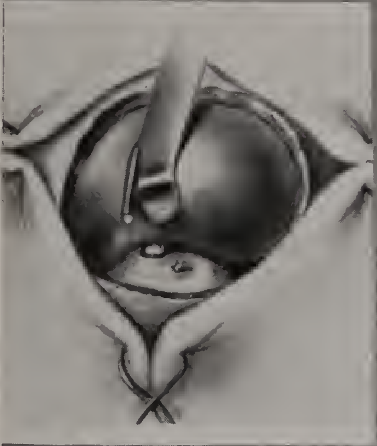
Fig. 4

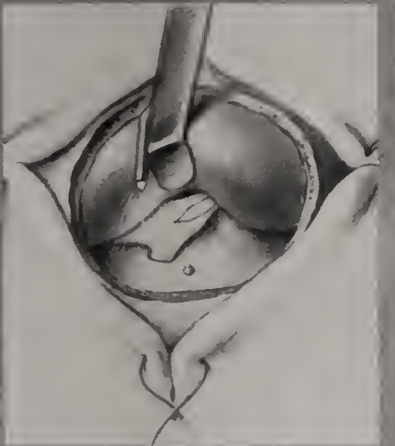
Fig. 5

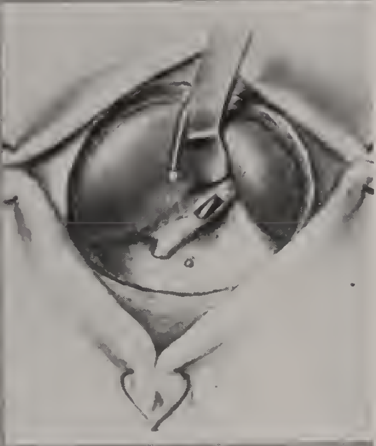
Fig. 6

Fig. 1. A longitudinal incision is made, the lower point of which is just below the point of zygoma.

Fig. 2. An opening is made through the skull, about 3 or 4 cm. in diameter. The base of the opening should be at the base of the skull.

Fig. 3. The dura is lifted by blunt dissection, exposing the middle meningeal artery. The artery may be clamped, ligated, or a small wooden plug placed in the foramen spinosum. Should the artery be accidentally torn, compression will soon check the bleeeding so that the foramen may be seen and plugged.

Fig. 4. After ligating the artery, the dura is raised and the mandibular branch is seen passing into the foramen ovali.

Fig. 5. The mandibular branch is followed backward to the ganglion; the dura is lifted until the sensory root is found. A longitudinal incision is then made through the dural covering, exposing the root.

Fig. 6. The motor root usually lies under the sensory root. It must be found and identified by applying an electrode. After identification, a small piece of the sensory root is resected. This should extend a little more than two-thirds of the way across the sensory root, if both the mandibular and maxillary branches are involved. This severs the funiculi of the mandibular and maxillary branches, leaving most of those of the opthalmic branch intact.

dependently advocated the approach through a high temporal root. Frazier[13], in 1901, divided the sensory root as Spiller[14] had previously suggested. Since that time there has been great improvement in the method of operation.

Previous to 1918, the entire sensory root had been avulsed. Frazier then suggested the saving of the motor root and the ophthalmic funiculus. This avoids, first, the paralysis of muscles on the affected side, and, second, the disagreeable keratitis and corneal ulcers that often made the existence of the patient after operation nearly as unbearable as previous to the operation. With the saving of the motor and ophthalmic fibers, these complications do not occur so that today the operation for section of the funiculi of the maxillary and mandibular branches in the sensory root gives very satisfactory results.

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[13] Frazier, Chas. H.: Extirpation of the Gasserian Ganglion. J. A. M. A., 43:943, 1904.

Frazier, Chas H. and Spiller, W. G.: Further Report upon the Treatment of Tic Douloureux by Division of Sensory Root of Gasserian Ganglion, Phil. M. J., 10: 594, 1902; Penn. M. J., 6:287, 1902-03; J. A. M. A. 43: 943, 1904.

[14] Spiller, W. G. and Frazier, C. H.: The Division of the Sensory Root of the Trigeminus for the Relief of Tic Douloureux: An Experimental Pathological and Clinical Study, with a Preliminary Report of One Successfully Treated Case. Univ. Penn. M. Bull., 14:342, 1901; Phil. M. J., 8:1039, 1901.

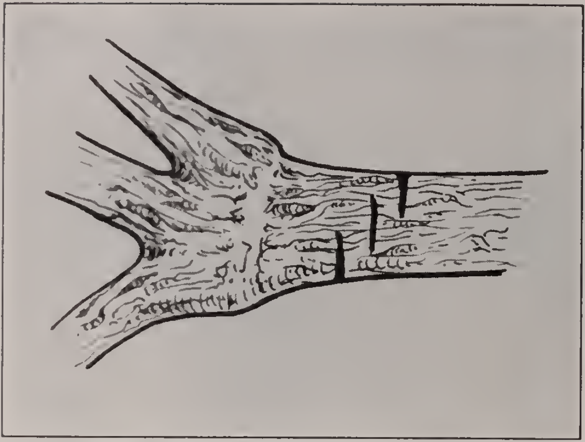

Fig. 7. An incision along the lower transverse line severs the funiculi of the mandibular branch and a few of the maxillary fibers. An incision along the midline severs the funiculi of the maxillary branch, a few of the mandibular fibers and a few of the ophthalmic fibers. The upper line represents the location of the of the ophthalmic branch intact.

The complications of the operation today are few. (1) Hemorrhage. With the careful ligation or clamping of the middle meningeal artery or the plugging of the foramen rotundum so as to compress the artery, hemorrhage is a rare occurrence. (2) Occular palsy is never seen any more, as it was due to extensive manipulation with the older technic. (3) Keratitis does not occur as the funiculus for the exophthalmic branch is not severed. (4) A transitory facial paralysis does sometimes occur. This is probably due to an edema and is always transitory so that it is of no serious consequence. (5) Hemorrhage into the ear, either in the middle ear or in the ear drum, is a peculiar complication due evidently to the extension of blood through a small canal. It has no clinical significance. (6) Numbness of the face over the distribution of the branches, whose sensory roots have been severed, of necessity occurs but this is preferred to the intense pain which the patient previously suffered. (7) Muscular paralysis does not occur as the motor root is not injured. Formerly there was a high mortality to these operations, particularly when the gasserian ganglion was removed, but today the mortality, as shown by the work of Stookey and Frazier, is less than 1 per cent, making the operation safer than that for appendicitis.

With the development of the technic to its present degree of safety, there is no reason why patients should be permitted to suffer because of either lack of treatment, or temporizing with alcohol.

ACUTE ABDOMINAL TRAUMA

ITS SURGICAL CONSIDERATIONS*

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In any case of abdominal trauma the decision must be first made whether the injury involves only the abdominal wall or the contained viscera are damaged. It will often require careful study and observation to settle this question. The patient's life depends on the correct decision, whether conservative management should be followed or surgical intervention is urgent. Knowledge of the usual nature and relative frequency of various visceral injuries will aid us in evaluating the probabilities of any individual case.

We are concerned in this review with nonpenetrating injuries. It is quite obvious that nothing will be gained by a period of observation in knife wounds and other penetrating injuries. These are all surgical and demand immediate repair. The only contraindication is profound shock.

Nonpenetrating injuries may be the result of remote or direct trauma. A man may suffer a ruptured liver by falling from a height or by being kicked in the abdomen. In injuries of the solid viscera, liver, spleen, kidneys, pancreas, and of the mesentery, the chief danger is hemorrhage; in those of hollow organs, stomach, intestines, and bladder, it is peritonitis.

The liability to injury, or relative vulnerability of the various viscera, is best shown by the figures reported by Geill[1] of Copenhagen (Table 1). He reported the findings in 494 autopsies. It is to be remembered that these are all deaths due to extreme violence, leading in most instances to multiple injuries. It is interesting to compare these figures with those of 161 surgical cases which I have collected from the literature and records at Tacoma General Hospital.

The discrepancy in frequencies depends largely on the fact that many of these cases represent less extreme and more localized violence. The comparison, however, also makes one wonder whether many lesions of the liver and spleen are not being overlooked. Kidney and bladder ruptures are more frequent in this group because nonfatal lesions of these organs are more readily recognized.

The liver is most liable to injury because of its size, friability and fixity. Firm ligamentous at-

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*Part of a Symposium on Tramautic Surgery Presented by the Tacoma Surgical Club at its annual scientific meeting, Tacoma, Wash., April 18, 1931.

[1] Geill, Christian: Die Ruptur Innerer Organe durch stumpfe Gewalt. Vierteljahrsschr. f. Ger. Med., Dritte Folge. 18:205-254, 1899.

Table 1

Copenhagen Autopsies (Geill) Total Number 494		Tacoma Clinical 161
Per cent		Per cent
59.9	Liver	20
33	Spleen	15
21.5	Kidneys	33
11.1	Intestines	15
7.1	Stomach	.6
9.7	Mesentery	.6
4.4	Bladder	13
.6	Pancreas	
1	Gallbladder	1.2
	Epigastric vessels	1.2

Shows relative incidence of visceral injury in autopsies as reported by Geill, and in clinical experience compiled from the literature and records of Tacoma General Hospital.

tachments limit its mobility. Injuries may be classified as lacerations through the surface, subcapsular hematoma, and central rupture or hemorrhagic cyst. All injuries are more common in the larger right lobe.

Laceration may occur on either the convex or concave surface, depending on the mechanism of production. Lateral compression of the upper abdomen will cause sagittal splits in the convex surface. A glancing or tangential blow may cause irregular transverse or oblique tears by pulling the liver edge laterally. Marked compression of the lower abdomen may so flare out the liver margins that sagittal tears appear on the concave surface. Falls from a height may cause similar tears.

When landing on the head or shoulders, with the diaphragm in the high position of expiration, the liver will be driven into this funnel-shaped space and will suffer lacerations on the convex surface just as in lateral compression. The diaphragm may rupture and the injured liver be actually forced into the pleural cavity, with resultant hemothorax. If the diaphragm is low in inspiration, the fissures will occur on the concave surface. By landing in the upright or sitting posture the same stretching and rupture of the concave surface may occur.

This sort of accident by the sudden tug on the coronary ligament may also cause deep crater-like tears at the points of attachment. If the force be less intense, only the capsule may be pulled from the parenchyma by the attached ligaments, producing subcapsular hematoma. In some instances the round ligament may actually cut through and sever the right from the left lobe, usually with severance of the left hepatic duct. Central rupture with intrahepatic hematoma and possibly eventual blood cyst formation results from a twisting mechanism.

Injuries may involve the extrahepatic vessels and ducts. The vena cava may be torn. If the common bile duct is torn, it is usually at the pancreatic margin. The hepatic artery and portal vein are less apt to give way. Hydraulic force in abdominal compression may rupture a distended gallbladder, especially if it contains stones (Vance[2]).

Symptoms of liver injury are varying degrees of shock, with signs of internal hemorrhage and eventually biliary peritonitis, if the ducts are torn. Pain, tenderness and rigidity may be more pronounced on the right side, and the pain may be referred to the right shoulder. Jaundice is seen in less than 5 per cent (Meyer[3]). Mann[4] has noted in dog experiments that a small piece of liver dropped into the peritoneal cavity causes a terrific reaction and almost certain death.

Management of liver injuries will be surgical unless one can be sure that the hemorrhage is not progressive. The bleeding will usually be best controlled by packing. Mattress sutures can be placed only in accessible lacerations, but usually would be too difficult or time consuming. If there is presumptive evidence in the nature, force and mode of application of the violence that there is liver injury, it is unwise to wait for positive signs (Hitzrot[5]).

The spleen is usually injured by direct violence. It is more protected, smaller and less firmly attached than the liver, but the same mechanisms apply. Hydraulic force is most important because engorgement and increased friability frequently make it more vulnerable. In leukemia, typhoid, malaria, etc., even sneezing or coughing may cause "spontaneous" rupture. Complete fragmentation by hydraulic force is not uncommon. Tears occur most commonly across the hilus, but may involve the convex surface. There may be complete avulsion of the pedicle. Subcapsular hematoma is an interesting lesion because it is apt to lead to delayed hemorrhage, several days after the injury, when the capsule gives way.

The danger of splenic injury lies in hemorrhage. There is left-sided pain and rigidity, with signs of bleeding. A daily fever may accompany contusions. Peritonitis or subphrenic abscess result if there is infection.

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[2] Vance, B. M.: Subcutaneous Injuries of the Abdominal Viscera. Arch. Surg. 16:631-679, 1928.

[3] Meyer, Karl: Acute Tramatic Surgery of the Abdomen. Minn. Med. 14:150-154, 1931.

[4] Mann, F. C.: Personal Communication.

[5] Hitzrot, J. M.: Subcutaneous Injuries of the Liver. Ann. Surg. 66:50-63, 1917.

Immediate laparotomy is indicated always. Splenectomy is the treatment of choice. The hemorrhage can be controlled by grasping the pedicle. Suture of lacerations will be done rarely, if at all.

Renal injuries are not included in my subject. They are frequent, and must always be considered in the differential diagnosis of true intraabdominal injuries. Opening the abdomen for such a lesion causes chagrin and further jeopardizes the patient.

The pancreas is firmly fixed in its retroperitoneal position. It cannot escape crushing injuries which compress it against the spine. The most common lesion is separation of the tail; next in frequency is a fracture through the midportion; and least frequent is a rupture through the head of the organ. If the peritoneum is torn, blood and pancreatic secretion escape into the peritoneal cavity. More commonly, however, the hemorrhagic accumulation is retroperitoneal or in the lesser peritoneal sac. Symptoms are those of severe shock, violent epigastric pain, and signs of hemorrhage with developing peritonitis.

The operative mortality is very high. Vance[6] places it at 72 per cent. Access to the gland is obtained through the gastrohepatic omentum, or by opening the omental bursa. Suture is seldom feasible, but packing is inserted to control the hemorrhage and to provide drainage for pancreatic secretions. In some cases traumatic peri- or endopancreatic cysts develop. These may become huge. Incision and tamponade or marsupialization are the accepted treatment.

The intestines may be injured by a tearing, crushing or bursting mechanism. Tears occur most commonly at the fixed points, viz., upper jejunum and terminal ileum. This may be a complete transverse section. A grinding force may contuse any portion of the bowel by compression against the posterior wall. The fixed duodenum is especially liable to this injury. Actual bursting occurs in compression of a loop, in which there is an accumulation of fluid or gas. The perforation usually occurs in the antimesenteric border.

The stomach is injured similarly. Tears are usually located in the prepyloric region, and bursting ruptures involve the fundus. Any tears or contusions may also involve the mesentery. Severe hemorrhage or gangrene of a segment of bowel may result.

The symptoms in these injuries are those of shock and perforation. In case of doubt, fluoroscopic examination may demonstrate free air in the peritoneal cavity. Time-consuming observation is never justifiable. Whenever there is any question of perforation of the bowel, the abdomen must be opened promptly so that closure of the perforation or resection can be carried out before fatal peritonitis develops. It is folly to wait for late symptoms.

The urinary bladder is another hollow viscus subject to rupture by blunt violence. Consideration of this lesion is not included in my assignment.

To mention the possibility of traumatic appendicitis and traumatic hernia is to invite controversy. Each condition probably depends on a previous abnormality. Suffice it to say that, if symptoms and signs of appendicitis follow trauma, it is just as important to carry out early operation as if there had been no history of injury.

SUMMARY

I have reviewed various traumatic lesions, pointing out that knowledge of the nature and mode of application of the violence will give presumptive evidence of the probable type of resulting injury. Such a review should broaden our index of suspicion, make us more alert to arrive at exact diagnoses, and should serve as a guide in surgical exploration. Decisions and diagnoses must be made quickly. Thoroughness is not slowness. Unless serious internal injury can be definitely excluded, or unless profound shock contraindicates it, early surgery will save more lives than will too much conservatism which awaits the development of late signs and symptoms.

"SANE" OBSTETRICS. H. J. Epstein and A. J. Fleischer, New York (*Journal A. M. A.*, July 25, 1931), believe that the expectant mother should have the benefits of "sane" obstetrics, rather than conservative or radical obstetrics. Such "sane" obstetrics can be maintained within the sphere of the incompetent though sincere physician and of the competent though overenthusiastic physician, by education of the former as to his limitations and of the latter as to the limitations of his modus operandi. The full cognizance by these two groups of the "obstetric risk" as an actual reality rather than a mere fantasy will temper their judgments, so that the incompetent will not plunge where angels fear to tread, and the overenthusiastic will not belabor the expectant mother with heavy artillery where diplomacy will serve better for her ultimate salvation. The obstetric risk in the author's study shows that: (1) The morbidity risk in operative obstetrics was to that in nonoperative obstetrics in the ratio of 5:1. (2) The mortality risk in operative obstetrics was to that in nonoperative obstetrics in the ratio of 30:1. (3) The total infant mortality risk in operative obstetrics was to that in nonoperative obstetric in the ratio of 3.6:1.

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[6] Vance, B. M.: Traumatic Lesions of the Intestines Caused by Nonpenetrating Blunt Force. Arch. Surg. 7:197-212, 1923.

FRACTURE OF THE LARYNX*

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Fractures of the larynx are rather infrequent. Only three cases have been reported since 1925. Marschik[1] reported a case of laryngeal fracture with penchondritis and recovery. Sharpe[2] reported a case of compound fracture of the larynx and recovery. Hill[3] reported a case of fracture of the larynx with emphysema. Only one case is reported with roentgenographic studies.

Stimson reviewed all the cases up to 1900. Of the 67 cases that had been reported, there were 54 deaths and 13 recoveries. Fracture of the larynx is much more infrequent, but also more dangerous than fracture of the hyoid bone. Death is usually due to edema of the glottis and vocal cords, suffocation or bronchopneumonia.

The causes are hanging, direct violence or choking. Delevan[4] reported a case in which a man sneezed and sustained a fracture of the larynx. The pathogenesis is by pressure of the collapsible surfaces together or by backward compression against the vertebral bodies. When the perichondrium is severed, there may be emphysema. In Sharpe's case it extended down to the inguinal region on one side.

The symptoms are local swelling and tenderness, aphonia, dysphagia, frothy and bloody sputum and emphysema. It is difficult to secure a good roentgenogram of the larynx, since it is cartilagenous, but when legal action is imminent, it is comforting to have one. Laryngoscopy shows edema and hemorrhage of the mucosa of the larynx and improper apposition of the cords. The arytenoid may be easily dislocated by violence and here the prognosis must be guarded concerning the voice. Where there is a probability of litigation, an hysterical element may enter into the case, rendering the return of the voice much slower.

Treatment consists in morphine for the pain and apprehension, bed rest, an ice pack on the neck, steam inhalations, and later oily sprays of soothing aromatics. If a fracture is diagnosed early, strapping may be advisable. One should be prepared to do a tracheotomy at any time, as the danger of suffocation is not only immediate, but it may occur days later. Rest of the voice is necessary. After the swelling has diminished so danger of suffocation is over, heat may be used in the form of hot packs or a penetrating light. The persisting aphonia, where there is no damage to the function of the cords, is due to the muscles being so sore from the contusion that one will not produce sufficient tension on the vocal cords to phonate properly.

The prognosis, after the rather imminent danger of death is over, depends on the laryngoscopic findings.

CASE REPORT

Miss M. McC., age 19, single. Occupation, saleslady. On the night of February 3, 1931, patient was attacked by a young man and choked. She sustained injuries to her upper lip, throat and eyes. He grasped her by the neck with considerable force. She did not experience much difficulty in getting her breath until about an hour later, when the swelling was most intense.

Physical examination revealed marked swelling of the throat in the region of the larynx. There was ecchymosis of both orbital areas and a small laceration was noted on the right upper lip. Direct laryngoscopy showed some edema and ecchymosis of the false vocal cords. There was no emphysema. The cords did not approximate well posteriorly. No crepitation could be noted, however. The area was very tender and there was considerable swelling. There was dysphonia and dysphagia. It pained the patient to attempt to swallow. Only liquids could be taken.

Patient was confined to bed, the larynx strapped, a cocaine spray used and an ice bag placed on the neck. Steam inhalations of comp. tr. benzoin were used. Hemopytsis persisted for three days, then stopped, to reappear on the sixth and eighth days. A roentgenogram of the chest and fluoroscopic examination were negative, as well as the physical findings. Morphine was given for two days, followed by bromides.

The patient was seen daily for ten days, then on alternate days. The swelling had not completely subsided at the end of two weeks. The patient had complete aphonia for a while, but was later able to speak in a whisper. At present, she is able to speak in a husky voice. One week after the injury, she developed a temperature of 100°. The fever lasted for three days. There was some increased tenderness of the larynx to external pressure at this time.

A roentgengram was taken on the eighth day. The roentgenologist reported a fracture of the anterior surface of the thyroid cartilage and a suspicious area around the cricoid cartilage.

CONCLUSIONS:

1. Another case of laryngeal fracture is added to the literature.
2. The aphonia in fractures of the larynx may become hysterical when litigation is pending.
3. Further roentgenologic studies of this interesting condition should be made.
4. The mortality rate of laryngeal fractures is around 80 per cent from all cases reported to date.

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*Read before a meeting of Puget Sound Academy of Ophthalmology and Oto-Laryngology, Seattle, Wash., 1931.

[1] Marschik, H.: Wien. klin. Wochenschr. 40:507. April 14, 1927.

[2] Sharpe, W. S.: Jour. Laryng. and Otol. 42:682-684. October, 1927.

[3] Hill, R.: S. Clin. No. Am. October, 1925.

[4] Delevan, D. B.: Med. Rec., 1913.

WHY THE ANESTHETIST?*

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How many of us have really given much thought to the question, why the anesthetist? What justifies his presence in the medical world, what real place has he in the ultimate success of the surgeon and the ultimate recovery of the patient; to what height of influence and esteem may he rise, if his work is properly studied and understood? What are his responsibilities and what position does he occupy on the surgical team?

Now that we have asked ourselves these questions, let us try to answer them. Let us endeavor to prove that the anesthetist answers a real need, that he performs a great service to surgeon and patient and that his place on the surgical team is not an inferior one, but a place, vital and necessary, on a par with that of the surgeon himself. Do I exaggerate? I think not.

Anesthesia as a specialty is young, a development of very modern times and well within the memory of many a living surgeon. The London Society of Anesthetists was organized in 1897, just thirty-four years ago, with Dr. Dudley W. Buxton at its head. The American Association of Anesthetists came into being fifteen years later, in 1912, during a meeting of the American Medical Association in Atlantic City. Dr. Thomas Bennet of New York City is believed to have been the first American physician to specialize in anesthesia, the honor of being the first Canadian specialist in this line going to Dr. Samuel Johnston.

Anesthesia in itself is one of the most merciful boons of a merciful God to suffering man. The late Sir William Osler called it "the greatest single gift made to suffering humanity," and Oliver Wendell Holmes, commenting on the discovery of ether and chloroform, declared that "the fiercest extremity of suffering was steeped in the waters of oblivion and the deepest furrow in the knotted brow of agony has been smoothed away forever." Dr. Weir Mitchell, who like Holmes, combined the offices of poet and physician, wrote of the discovery of anesthesia in the following poetic words:

> "No hour so sweet as when hope, doubt and fears,
> 'Mid deepening silence watched one eager brain,
> With God-like will decree the death of Pain."

Do we exaggerate the importance of anesthetics? Not if these great surgeons are to be believed.

Anesthesia has made modern surgery possible and modern surgery has made the development of anesthesia a necessity. Indeed, according to Finney, the most notable contribution to modern surgery in this Twentieth Century has been the skilled anesthetist. As far back as 1909, Dr. R. S. Cathcart, at a meeting of the Southern Surgical Society, asserted, "The office of the anesthetist is second to none at an operation, for upon him depends much of the successful termination of the case."

Although the art of anesthesia has made tremendous strides during the past twenty-five years, and perfection of apparatus and introduction of new and additional anesthetic substances have given wider and greater range to the work of the anesthetist, the human element still remains the biggest factor, and it is yet a fact that upon the skill and conscientiousness of the anesthetist often rests the success or failure of the operation.

As surgery made its forward strides it became apparent that anesthesia must do likewise, must keep pace with the procession. Improvement in methods of administration became imperative and to the men who came from the ranks of the general practitioners and turned their attention to anesthesia must go the credit for its phenomenal development as an art and a science. Anesthesia has, then, in the last quarter century, passed from the empirical stage to that of an acknowledged and highly developed science, for, contrary to the opinion of the uninitiated, there is infinitely more of it than the mere production of sleep.

The competent anesthetist today knows not only the effects of the different anesthetic agents but their methods of application, their dosage, dangers and safety zones. Anesthesia is no longer a question of simply soaking a patient with ether or any other anesthetic, but the fine art of carrying the patient to the anesthetic depth necessary for the work of the surgeon and for the safety of the patient, not only while on the table but when the operation is over and done with.

It is a fact, proven by years of observation and experience, that, despite the notion that specialists can be developed only in medical schools and great teaching hospitals, some of the most far reaching advances in the administration of anesthetics, some of the most notable discoveries have been made by the men who came to this specialty from general practice. Many of the most highly qualified and successful anesthetists have emerged from the ranks of the physicians who, after years of general practice, went in for anesthesia as a part time specialty. Short on laboratory research these men may be, but they are long on clinical experience, long on a sense of personal responsibility and they frequently outdistance their colleagues from medical schools and great teaching hospitals.

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* Read before a Meeting of Pierce County Medical Society, Tacoma, Wash., May 12, 1931.

The general practitioner who takes up anesthesia brings from his own wide and varied experience the knack of handling patients and winning their confidence, both important factors in the ultimate success of the operation. He brings a skill in diagnosis, which gives him a clear insight into the risk involved in each particular operation. His experience and general practice enable him to recognize any complicating factor that may arise, factors that sometimes are a greater danger to the patient than the operation itself. He is able properly to prepare the patient for the operation, to gauge vital depression and prescribe proper remedies for complications and emergencies, that, uncared for, might end in death. His ability to estimate and evaluate risks, to meet emergencies and care for them does more than is usually credited in reducing surgical mortality and morbidity to the vanishing point.

What, then, should be the relation of the surgeon and the anesthetist? And what, too, are the relations of the anesthetist and the patient? Since we have seen that a good anesthetist is as vital to the success of any operation as is a good surgeon, it follows that a man who thoroughly knows anesthetics should be an integral part of every surgical team. Anyone can be rounded up to put a patient to sleep but only the able anesthetist knows just what type and just how much of an anesthetic to give. Familiar as he is with the sensitiveness of the different parts of the anatomy, he varies his anesthetic accordingly. He knows that upper abdominal requires a more profound anesthesia than lower abdominal work; he knows it takes a deeper anesthesia for rectal work than for a breast operation. Is it not apparent how his skill can supplement and lighten the work of the surgeon and benefit the patient?

A surgeon, once wishing to compliment an anesthetist, said at the conclusion of an operation, "the patient took the anesthetic very well." To his surprise the anesthetist replied, "I administered the anesthetic very well." And the anesthetist was right.

It is the duty of the surgeon to make every compromise for better anesthesia that is compatible with safe surgery. By working together, surgeon and anesthetist can both contribute to the success of the operation and the rapid and uneventful recovery of the patient. Safety factors, it must be insisted, should take precedence over the surgeon's convenience. An anesthetist, who has an acquaintance with surgical procedure and knows the delicacy of the vital organs to be handled and the depth of anesthesia needed for each step in the operation, is able through this knowledge to so shade the administration of the anesthetic, that at no time is he overdosing or unduly endangering the patient. At the same time he is giving the surgeon all the relaxation proper and necessary for each step of the operation. Despite the opinion of the ordinary surgeon, he is not the best anesthetist who has the patient at all times completely relaxed; on the contrary, the best anesthetist is he who keeps the patient on that edge of depth which just permits the work under way, who distinguishes clearly between what may be called a medicinal and a near toxic dose.

Newer knowledge of pathology and chemistry of the pharmacology and physiologic action of various anesthetic agents, development of anesthesia into a definite specialty, make scientific and selective anesthesia the right of every patient. Any surgeon who demands ether anesthetic on the grounds that in large surgical volume it is the one universally applicable agent, that its routine use is within the province of most anyone and simplifies the day's work, may get by in nine out of ten cases. But in his tenth case he may have a kidney impairment that may prove fatal, a pneumonia, a lighting up of an old tuberculosis, or he may augment shock that was preexistent or developed during the operation.

It is now ten years since routine ether began to be displaced by other agents. At that time nitrous oxid and oxygen began to be used. Five years ago came ethylene, and these two became our chief anesthetic agents. Ether always caused an increase in glycosuria, blood sugar, acetone and diacetic acid, frequently with disastrous results. With nitrous oxid and oxygen, also with ethylene, there is shown some increase in diabetic tendencies, but these agents were such an improvement over ether that their disadvantages might be considered negligible.

An interesting present day development is the introduction into the realm of anesthesia of drugs of the barbital group, of which luminal, nembutal and sodium amytal lead the field. Of these the last named, sodium amytal, is the least toxic, the least depressive and most effective in its action if given intravenously. Faulty administration has aroused some prejudice against sodium amytal, but skillfully given it is exceptionally effective and a real boon to the patient, who loses consciousness in his room, knows nothing of the dreaded trip to the surgery, the surgical preparations, and regains consciousness again in his room, long after the operation is over. Surely, too, an agent that eliminates nausea, retching, vomiting, shock and struggle and excessive dehydration has much in its favor.

Keen has said, "The ideal anesthetic will abolish pain by the abolishment of consciousness without danger to life." All are agreed that the ideal anesthetic has not yet been found. All are toxic to a greater or less degree, and it is still the problem of the anesthetist to select the least toxic to a patient under given circumstances and to administer it as carefully and skillfully as possible.

This brings us into the field of the relationship of the patient and the anesthetist. Is the latter merely to put the patient to sleep, make him oblivious to pain, or is he to be prepared by temperament, training and skill to properly evaluate any condition he finds in the patient, to meet any emergency? Must he be ready to offer a service to the patient, the service of administering the correct anesthetic so skillfully, so safely, so humanely that the patient is helped along the road to a quick and uncomplicated recovery?

Ability, experience and personality, and a wide knowledge of medicine and surgery should be the stock in trade of the anesthetist. He should have the power to inspire confidence in the patient, to win his respect, his friendship, to allay the fears that torture ninety-nine out of every hundred men and women facing an operation and its attendant anesthetic.

He must be able to estimate the risk, incident to each operation, to use all the resources of medical progress for the preparation of the patient, to judge of the degree of vital depression following the operation, and to successfully handle any complications that may delay or interfere with recovery. These factors are what make him the invaluable internist of the surgical team, the necessary consultant of the surgeon and the watchful guardian of the patient.

It is highly desirable that the anesthetist should see the patient before the operation, to acquaint himself with his character and condition, the disease from which he suffers, and the operation contemplated. As Sir Berkeley Moynihan said in an address on Hunter's ideals and Lister's practice, "Our main concern these days is with the condition of the patient before and after the operation. We seek to make him as safe for surgery as surgery has been made safe for him." The ideal arrangement, indeed, would be to have the patient in the hospital twenty-four hours before the operation. The anesthetist could then check up on him thoroughly, decide whether he is a good, fair or poor surgical risk, select the anesthetic to be used as well as the preoperative medication. The patient's confidence could be gained so that he will approach the operation with no fear of the anesthetic, generally far greater than fear of the operation itself. Friendly contact with the anesthetist would assure him that his case was receiving due thought, care and preparation.

There is no doubt that this mental preparation of the patient prior to his arrival in the surgery vastly lessens the dangers of surgery. There is inbred in almost every human mind a terror of losing consciousness, a horror of letting go his grasp on the material world, a fear of sinking into that oblivion from which there may be no return. It is the anesthetist's duty, it is his privilege to buoy up the patient, to instill in him a confidence that all will be well. When fear has been alleviated, there is undoubtedly less danger of postoperative shock or complications.

Moreover, the anesthetist should have the opportunity of studying, not only the present condition of the patient, but the history of his case, the history of his ancestors. A syphilitic, a tuberculous or a hemophyliac heredity may render a simple operation extremely dangerous. Given a thorough understanding of the physical and mental features of the case, the anesthetist can then prescribe the correct preoperative medication.

It is most essential that the patient have a restful night, undisturbed by any mental agony. Such remedies as will bring this to pass should be given, and of all remedies available, I know nothing better than amytal, either the acid or the sodium salt. It is nontoxic, nondepressive and leaves no unpleasant hangover. As to the preoperative medication, there should be nothing haphazard, but medication clearly indicated by the mental and physical condition of the patient as well as by his idiosyncracies, if such exist, to any certain type of preoperative treatment.

Generally speaking, a splendid type of preoperative medication is morphine in split doses, combined in a 25 per cent sulphate solution. Dependent upon how much of this is needed, it may be administered in one, two or three doses of one-eighth grain morphine each, the last dose to be given a half hour before the trip to the surgery.

Undoubtedly there is no feature of the operation more trying to the patient than this same trip to the surgery, being placed on the cart, wheeled along the hall, put on the table, strapped in place. The sight of the surgery, the instruments, etc., strike terror into the heart of most every patient, a condition that is certainly no aid to progress and an ultimate recovery.

Earlier in this paper I referred to the discovery and use of the drugs of the barbital group, luminal, nembutal and sodium amytal, the last named of which I regard as the best of the group. Along with its other advantages the use of sodium amytal eliminates this trying feature of the operative process, this terrifying trip to the surgery, and if for no other reason, is a blessing to the patient as well as to the surgeon and anesthetist. The patient who has taken sodium amytal comments on this favorable feature, this privilege of going to sleep quietly in his own room, and waking up again quietly, in his room when all is over.

However, if the loss of consciousness and the induction of the anesthetic must be deferred until after the patient reaches the operating room, the skill and tact of the anesthetist must be brought into play to make the ordeal as easy as possible. The careful anesthetist, working to eliminate any subconscious fear or struggle, will begin his anesthetic with some agent that has no odor, no depressive action, and arouses no feeling of suffocation. Nothing for this purpose is better than nitrous oxide and oxygen; while giving this the anesthetist will keep encouraging the patient so that a quiet natural sleep is obtained.

At this point it seems fitting to say something about the decorum of the operating room. Since human life is a sacred thing, and human fear a pitiable state, there should be a dignity, a quietness about the operating room that will make a favorable impression upon the patient's mind. Years ago Dr. Noyes, a noted ophthalmologist of Detroit, complimented an Eastern surgeon upon the conduct of an operation. "There was a seriousness and dignity observable," he said, "no story telling, no laughter. A patient undergoing an operation may be near death, and it is not the time for jesting when a life may be ebbing away." What is more distressing, more annoying than to see a patient being wheeled along the hall or on the table in the operating room, to hear stories, laughter, gossip on the part of thoughtless, yes and heartless nurses, while the patient is agonizing in fear. If he were a murderer going to the electric chair, there would be more decorum.

Having gotten the patient to sleep and to a point where the operation may be carried on, it then devolves upon the anesthetist to know exactly, at every stage of the operation, the condition of the patient. His thorough examination prior to the operation has given the anesthetist a good idea of the patient's natural condition. However, the induction of an anesthetic and submission to any surgery always taxes, to more or less of a degree, the patient's circulatory system, and as the operation proceeds, there is always present the possibility of shock, one of the gravest dangers incident to surgery.

To ascertain the circulatory balance we have only one method at hand. The feeling of the temporal or the radial pulse of the patient is no barometer as to his condition. That can be ascertained only by a continuous and painstaking record of the pulse, respiration, systolic and diastolic blood pressures. This should be graphically before the eyes of both the surgeon and the anesthetist at all times during the operation.

A comparison of the preoperative and operative readings is necessary to evaluate any change taking place that may be endangering the patient's life. There is no guess work in this method. Through interpretation of these readings, the anesthetist is able to warn the surgeon, not when shock is taking place, but fifteen or twenty minutes before the grave danger point is reached. This also permits the scientific use of stimulants to correct conditions leading to shock, respiratory paralysis and cardiovascular collapse. In short, it prevents disaster, an unsuccessful surgical conclusion and that great surgical misfortune, a death on the table. Through media of these findings, too, proper and essential postoperative treatment may be selected, all leading toward an uncomplicated and uneventful recovery.

To sum up, it is the privilege of every patient, be he a good, fair or poor operative risk, to have this care, prior to, during and after the operation, and it may be added that in the "poor surgical risk" group, this timely preparation, well chosen and carefully administered anesthetic, and proper postoperative medication often spells the difference between life and death.

A paper of this type cannot help but contain some propaganda for the anesthetist, but I have no apology to offer, only the hope that I have proved, first, that scientific, modern anesthesia is possible only by the presence on the surgical team of an anesthetist who is capable of serving in a consulting capacity in addition to being a skilled technician in all the mechanical phases of anesthesia; second, that scientific anesthesia cannot be routine anesthesia, that the greatest safety to the greatest number of patients is to be achieved only by selecting the agents, methods and technic for the individual case and never, never by fitting the patient to the anesthesia.

Safety should be the watchword of the modern anesthetist, safety first and at all times for the patient. Fear of the anesthetic and its outcome is the phantom that lurks in every patient's mind, and it is not only that tragic incident, a death on the table, that is to be feared, but the death occurring one, two, three and even four days after the operation, due to an anesthetic poorly chosen, badly administered.

If the surgeon allows the anesthetist who is working on his case to be nothing more than a high class technician, if his judgments and opinions are not sought, if the surgeon insists on dictating the kind and the amount of anesthetic to be administered, then he is not giving his patients the benefit of modern, scientific anesthesia. Neither, by the same token—and I care not how great a surgeon he may be—is he giving his patient a square deal.

The skilled anesthetist can bring to the surgeon's clinic selective and safely administered anesthesia and with it a greatly reduced postanesthetic toxicity and a reduced mortality. But he must have the cooperation, the understanding of the surgeon and the opportunity to bring into play his knowledge and experience.

The calling of an anesthetist is a high and a noble one; it is his privilege to conserve human life, to contribute his important part of the healing of human ills and human misery. He must take his work seriously, he must do it conscientiously, he must value it at its true worth. In no better way can I close than by expressing the hope that we American anesthetists may be worthy to take as our slogan, the words our Canadian colleagues so proudly wear in their lapels: "We safeguard those who sleep."

Spontaneous Rupture of Kidney Due to Encysted Calculus. Earl Floyd and J. L. Pittman, Atlanta, Ga. (*Journal A. M. A.*, July 1,1 1931), report a case of spontaneous rupture of the kidney due to an encysted stone and review the literature on this subject. The stone had evidently been present for four years and possibly much longer. An examination and pyeloureterogram, made three months following operation, revealed that the kidney was almost normal.

THE PSYCHOLOGY OF VISION*

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Emmanuel Kant taught that what we see is in our eyes or minds. We do not see the object but the image, and the image is only what we imagine it to be. "The universe is thought." Modern psychologists are approaching Kant's point of view but are making that approach by way of physiology and histology rather than by way of metaphysics.

Years ago, when I was a boy at school, the question was asked, "If a gun is fired in the middle of the Sahara Desert will it make any noise, if there are no ears to hear it?" And the, to me, astonishing answer was, "No. Those waves of the atmosphere will remain mere waves of the atmosphere unless and until some kind of 'ear' catches and transforms them into terms of sound."

Then the further question arose, "How about light?" And the reply has to be, "Those waves of the 'ether' will remain waves of the 'ether' unless and until some kind of 'eye' catches and transforms them into terms of luminosity." Then, all that pertains to light—color, "form," shades, reliefs, perspective, parallax, "motion," grace, beauty—all that we see is of our own envisagement. The eyes have it.

It is an inspiring thing to me that the eyes alone can give the rose its beauty or the dance its grace. But, lest we flounder at the start, let us develop our subject a little.

OUTLINE OF THE SUBJECT

Dr. Oliver Wendell Holmes came very near outlining the subject when he remarked that, when you meet a pretty girl, she is entitled to have you give her three distinct looks; first, a glance that will enable you to know that some kind of an object is in front of you which you must avoid running against; second, a longer look to determine whether she is an acquaintance whom you should greet; third, a good long look to admire her beauty and charm.

1. Your first glance at an object gives you a vague, unanalyzed but unified picture of an objective reality, which, if the sensation be strong enough, may cause you to wish to investigate and experiment; in other words, examine the object.

2. If you are sufficiently aware of it, and the object elicits sufficient interest, you will prolong your view of it and will begin to experiment with it, physically or mentally or both.

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3. You will "turn it over in your mind," noticing the relation of its parts, one to an other.

4. You will see the relation of the object to its surroundings.

5. You will visualize its design, meaning and purpose.

6. If your "mind's eye" is capable of doing so, you will visualize the object ideally, and endow it with your own personality.

Now, may we develop each of these points for a few minutes? Even merely glancing at an object requires two factors, ocular and cerebral. Let us start with the image on the retina.

THE OCULAR ELEMENTS

The retinal image elicits two perceptions, color and depth. A whole evening could be spent profitably in considering the subject of color, its supposed relation to the retinal cones, its relation to the spectral dispersion of light, its relation to complementary afterimages, retinal fatigue, threshold intensity phenomena, etc. It will be enough for the purposes of this paper to say that the color sense is an endowment. If one has the requisite retinal cones, and has discriminate judgment for colors, he will see colors. If he does not possess this endowment he will be more or less color-blind.

The perception of depth, too, is a matter of endowment and of judgment. But judgment is an acquired faculty. The infant's first view of an object is supposed to be that of a flat picture giving form and outline. This form is supposed to be dependent upon the presence of the retinal rods. Some idea of depth may be acquired in monocular vision, assisted by the other senses, but satisfactory stereoscopic vision can come only when the infant has acquired muscular sense, "fusion" sense and what Dewey calls "acquisitive inquisitiveness." We shall speak further about "form" when we come to mention Kohler's "gestalten."

SEEING IS A REFLEX ACT

Before considering "gestalten" it seems necessary to say (1) the visual act is a reflex act but is such only when the ocular and the cerebral elements cooperate. We may stare at an object without seeing it. (2) The so-called image on the retina produces photochemical change in the rods, cones and other structures. (3) The corpuscular theory as to the nature of light is coming back. Democritus three hundred years before Christ taught it; Newton advanced it, after which the idea was superseded; and now Einstein takes it up again, since light has some properties that seem to demand the corpuscular theory for their interpretation.

(4) The conduction of this photochemical change along the axions of the fibres of the optic nerve constitutes the conveyance of the retinal sensation to the brain. (5) The real act of vision does not start in the rods and cones, nor in the ganglionic cells, but in the synapses. (6) Exercise lengthens the axions and thus promotes possible juxtaposition of filaments at the synapses, both those of the afferent bipolar cells and those of the efferent axions of the dendrites of the multipolar central cells. (7) All reflex sensations result in motion of some kind, somewhere.

(8) Any reflex act is more than a reflex act, the path taken through the maze of the trillion possible paths not being wholly contingent upon the nearness of the filaments at the synapses. The path is more or less a chosen one, even in the so-called involuntary reflex acts. There must, therefore, be some sort of central-cell judgment, choice and command. (9) This reflex act, with its choosing, judging and commanding, may be accomplished unconsciously as well as consciously. Modern psychologists are applying the term "consciousness" to somatic processes, for these are reflexes, and applying the term "awareness" to psychic behavior.

Upon this known physiologic and histologic basis Dewey, Mason, MacDougall and the rest found their doctrine of habit formation, Bergson his doctrin of memory traits, Spencer his theory of instincts, etc., all being made possible by supposing that the use of certain paths make these more and more easily followed in reflex acts. Crile tries to prove it backwards. By studying the effects of disuse upon the synapses, disuse by starvation, exhaustion, shock, etc., he demonstrates histologically that disuse shrivels and shortens the axions and widens the synapses, thus lowering reflex activity.

ELAN VITAL

To complete this reference to the nature of the reflex act in the consideration of the act of vision we would, unless we were "radical behaviorists," have to say that something more than physicochemical change takes place in the neurons in the act. There is a something that receives the sensation, reflects about it, and sends forth command for motion. Bergson calls it the *elan vital,* but I cannot see that this clarifies our view. Aristotle's "divine essence" was about as good a guess. No, we are floundering. We shall have to acknowledge that this "we" in "us" is something at present beyond our understanding.

NOW FOR GESTALTEN

When you look at an object you begin to experiment with it physically, mentally or both. Look at the full moon. It looks like a yellow disc with smudges on it. Yet even as you look the smudges take shape; the outlines of a woman's profile, perhaps, appear. Look at a puzzle picture. You will see a tree with numerous branches and leaves and nothing more. Yet presently a rabbit appears among the branches. Many curious optical illusions are thus produced, as when the spiral seems to revolve or the basket turn inside out. The cloud in the sky that looks so like a camel suddenly looks very like a whale.

Köhler, who in very recent years has greatly advanced this part of the psychology of vision, calls these forms "gestalten." We so call them since we have no equivalent English term. It is not the "form" we wish to refer to, but the changing of the forms. Köhler, Koffka and others are studying gestalten intensely, and are showing how the knowledge of it may be applied practically in every-day affairs. We have not space to describe their beautiful demonstrations of gestalten but will intimate their importance later in the paper.

When we see a thing, we see it with reference to the relation of its parts one to another. Take the automobile. You see four wheels, a bumper, radiator, windshield, etc. But you see these parts as related to one another, conjoined in harmonious, cooperative adjustment. You may not know all the relations of its parts; you may not know the ratio of the gear-wheel mesh, but you sense a relation, and you judge the whole as made up of cooperative parts.

You see the automobile as a whole because the retinal image is a whole. And in sensing the relation of the parts you are performing mental experiments similar to those you make with gestalten. And whatever formal change you may make in your ideas of the automobile, you make, not with the retinal image, but with the cerebral perception, with the "mind's eye."

In this way the architect can see his house as a whole, the inner and hidden parts as well as the obvious ones; can even represent the hidden parts in his blue-prints; and he can change his "forms" of it as they seem to require changing. He has a kind of geometric sense, a sense that made geometry so divine a science to the Greek philosophers.

When we see a thing, we see it with reference to its surroundings. This seems a trite observation. That is because we are considering the matter lightly. For the relations of a thing to its surroundings mean, if you consider the matter rightly, that they are far-reaching histologic, sociologic, ethical relations. And it elicits a whole swarm of discussions, the vitalistic vs. the mechanistic sequence of events; free-will vs. predestination; static creation vs. evolution, etc. We cannot, of course, dwell longer upon this ethical side of vision but it brings us to the next point.

FANCY

When we see a thing we see more than the summation of its parts and more than its physical relation to its surroundings. We see, or fancy we see, its design, its meaning and present purpose. We see its place in the scheme of things. This was Lewes' contribution to the subject of the psychology of vision, and it was a great contribution.

Take the automobile again. It is more than a mere additive thing, more than a collection of adjusted parts. It is an automotive mechanism, fulfilling a purpose and influencing civilization.

To be sure, our fancy sometimes makes us see awry; our imagination gives the thing a meaning and perhaps a form unwarrantedly. The shepherds of old peopled their heavens with the images of their heroes. In the fever of delirium, and even in health, we sometimes "see things." And while this trait of vision partakes of the nature of a defect or disease, we must remember that diseases are "natural." Disease is not something supernatural. It is not some evil spell cast upon us, some evil spirit to be exorcised. No new laws are involved in the process of disease that are not used in the processes of health. Disease means only that our natural and customary functions and organs are not working harmoniously together. Simply, something is out of kilter. And this applies to mental processes as well as to somatic conduct. And so "natural" is disease, that it is a very short step from day-dreams and distorted fancy to

INSPIRED IDEALIZATION

If we are capable of doing so, we will see things ideally. We first experience the thing by looking at it and examining it; we must have experience of it before we can have any knowledge of it. Then, with the knowledge we have of it we ponder upon it, fitting it to our theories, adjusting it to harmonize with our collection of "things." Wondering about possible purposes and admiring its obvious or suggested beauties, we idealize it.

This ability to idealize the thing we see is the highest trait of vision. It forms the basis of emergent evolution, at least the part of it that pertains to "natural selection," for to it belongs the cultivation of culture, sense of beauty and higher aspirations. With it we find meaning where perhaps no meaning was intended; beauty where perhaps no one else sees beauty. You wonder why certain persons sit enthralled listening to a jangle of sounds called Grand Opera; but if they hear the harmony, the harmony is there. You wonder what the lover sees in his mistress to admire, since she seems so homely to you; but if he sees beauty, beauty is there. This idealization of the things we see makes us artists, sculptors, poets, geniuses. With it research workers, scientists, artists become "inspired." The laborer becomes the artisan, the artisan becomes the artist, the artist becomes the genius. Without it we have eyes but see not. The primrose by the river's brim a primrose is and nothing more.

515 Seaboard Building

BILATERAL ORBITAL ABSCESSES

SIMULATING CAVERNOUS SINUS THROMBOSIS *

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Due to the intimate vascular relationship between the upper lip, nose, orbit and brain, any infection of the former is always of importance because of the ever-present danger of orbital or intracranial involvement. It has recently been my privilege to see an unusual case of this type in consultation. The infection produced bilateral orbital abscesses that so resembled a cavernous sinus thrombosis as to be very disconcerting to all concerned.

Occasionally a case of cellulitis resembling cavernous sinus thrombosis is reported. I have so far been unable to find a case of bilateral orbital abscess and for that reason am presenting this one.

History. Japanese boy, T. K., age 12. He was perfectly well until four weeks ago. He then developed a pimple on his upper lip near the mid line; a local physician opened it without relief. Three days later he developed a similar pimple a little nearer the base of the nose. This was likewise opened. The next day the nose and both eyes became swollen. He was treated at home for seventeen days but without relief. He was then transferred to the hospital.

Examination. When seen at the hospital, the child's temperature was 102°, pulse 130, respiration 24, w. b. c. 26,000 86 per cent polys. Urine showed slight trace of albumin. Both eyelids were enormously swollen, particularly the upper lids. The normal depression between the nose and the free margin of the upper lids had entirely disappeared. There was considerable redness of the inner portions of both lids. The vision of the right eye was 20/30, the disk was slightly red but otherwise negative. It was impossible to get a visual field; movements of the eye were normal. The left eye was proptosed about one cm., pupil widely dilated, complete ophthalmoplegia with total loss of vision, including light perception. The disk was dead white. There was extensive herniation between the eye lids, of the lower conjunctiva. There was no nasal discharge; the nasal mucous membrane was red and lightly swollen.

Wassermann was negative. Roentgen examination of sinuses was negative. The frontal sinus was extremely large for a child of this age. Cerebrospinal fluid was clear, cells 8 per cmm., pressure normal. The child complained of severe frontal headaches. He was dull and sleepy but could easily be aroused. He answered questions correctly but possibly a little slower than usual. Knee jerks normal, sensation normal, no babinski. The general physical examination showed a boy emaciated, but was otherwise negative.

Were we dealing with a cavernous sinus thrombosis? The child as he lay in bed seemed almost a classic case. However, the long history, the fact that it was not rapidly progressive and his mental condition seemed to be better than one would expect with such a picture made us believe that our pathology was extracranial rather than intracranial.

Operation. The next morning the general condition was worse and a beginning extraocular paralysis was noted in the right eye. A diagnosis of a bilateral orbital abscess was made and an operation for relief considered a necessity. The abscesses were thought to involve the apices of the orbits. It was decided to open the frontal sinuses and by removing the orbital plate as far posteriorly as possible, to drain each orbit. The left orbital plate was first opened; after the tense periosteum lining the orbit was incised, dirty greyish white orbital fat presented itself. No pus could be obtained.

The orbital plate on the right side was then opened and, although the right ocular symptoms were less than the left, an immediate flow of creamy yellow pus was obtained; probably from 10 to 15 cc. was evacuated. Drains were inserted in both orbits through the frontal sinuses.

The next morning the swelling had entirely gone from the right eye. Ocular movements were normal and the patient's temperature was 99°, the lowest recorded since being under observation. The left eye was unchanged. The patient made a good postoperative recovery and seemed brighter. It was still felt that an abscess was present in the left orbit, although our exploration was so far unsuccessful. The child appeared better but he continued to run a septic temperature, had a slight constant headache and was slowly losing ground. As our exploration of the inner side of the left eye had been unsuccessful, it was decided to explore the outer wall.

The next morning before going to surgery, a small abscess appeared at the inner canthus of the left eye. This was enlarged and a very considerable amount of pus was evacuated. The laboratory showed a staphylococcus. The patient's temperature rapidly fell to normal, the swelling of the left eye disappeared and in about a week, the child was discharged.

Present condition. (Three months after operation). Gained 18 pounds in weight. OD, vision 20/20, eye grounds normal, fields normal, ocular movement normal. OS, vision none, light perception none, pupil widely dilated; ocular movement consists of adduction and abduction only. No change in size of eye.

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*Read before Honolulu County Medical Society, Honolulu, T. H., Sept. 5, 1930.

PREVENTING TUBERCULOSIS IN THE HOME*

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The subject of the prevention of tuberculosis in the home gives latitude, especially in this state. No intensive studies have been made, but for several years it has been the impression of national and state workers that the problem of preventing tuberculosis centers around the family group and home. Oregon does not have the industrial conditions which show a special tendency to spread the disease or to encourage its development, neither does she have the extreme congestion of her population with its attendant crowded and unsanitary housing conditions as in many parts of the country.

In outlining this subject, three important points come to my mind. First, the detection of the case; second, the introduction of efficient personal hygiene and sanitation; third, the treatment of the housing quarters, so that they will be safe for future occupants.

DETECTION OF CASE

In our program of disease prevention and control it is well recognized that the detection of the case of tuberculosis is a most important thing and certainly there is no place where the undetected case wreaks the havoc that he does in the home. Medical literature is well dotted with reports of the unsuspected case of pulmonary tuberculosis among grandparents, parents and other relatives; nurses, governesses or other hired help who have infected members of a household with tuberculosis, not infrequently with a form of clinical importance if not fatal.

Very early in my experience at the State Tuberculosis Hospital, two brothers were admitted with active far-advanced disease. Their life at the institution soon prompted them to inquire as to the possibility of their own father having tuberculosis. When they put this question to me, I told them it was quite possible and that I would be glad to follow it up further, if they would have the father call on me the next time he was over. The result was the discovery of a chronic open case, whose history would indicate disease of some thirty years standing, whose sputum was more loaded with germs of tuberculosis than was that of the boys themselves, although in general appearance the father seemed quite well preserved and had no sympathy whatsoever with the idea that he was a menace. Both of his boys succumbed to the disease and many years later I found him offering testimonials as to the efficacy of certain mud baths for rheumatism. I have no doubt at all that he continues to expectorate the bacilli of tuberculosis wherever he goes. Since that time similar experiences have been quite common.

Young patients still looking forward to the future in life, ambitious to learn and anxious to spread knowledge, very commonly cause inquiry into the health status of those with whom they have been in contact. Every little while some physician, either directly or indirectly interested in health prevention as a medical program, advocates health examination of governesses and nurses of children. We already have laws in our statute books compelling health examinations for certain occupations, especially of food handlers. That such examinations will almost never detect the more quiet forms of open pulmonary tuberculosis goes almost without saying, unless a roentgen film is used. No routine physical examination of the chest is apt to be thorough enough to detect a low-grade lesion, although it may be an open one, unless the examiner's suspicions are already aroused and he is fairly expert in such examinations. Even then, there are certain central types of lesions pretty well covered by good lung tissue that can not be detected except by a roentgen film.

Therefore, I feel it is entirely consistent with the circumstances and with the needs in tuberculous control, that we ask for health examinations, including a roentgen film for as many people as possible, and especially for those members of a household who are not entirely well and yet who are not so definitely ill that they are under the care of a physician and not infrequently are carrying with them an open low-grade pulmonary lesion of tuberculosis. I am presenting some films which will show you the experience which we have had recently with some such studies.

Under the heading of detection of cases some very important work has been done recently which brings out a very important phase of tuberculosis work, especially in contact children. The group at Phipps Institute, including Drs. Opie, McPhredran, et al, have made some very extensive studies of families in which there were open cases of tuberculosis as compared with families in which there were none. They have found that children at age five show eighty per cent reactors, when they are in contact with open cases in the family and only twenty per cent, when they are not. Further careful studies carried over a period of years has shown that ten per cent of these children become manifest clinical cases of tuberculosis. Twenty-two per cent show advanced tuberculous infection and four per cent show latent infiltration of the lung.

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* Read before the Annual Conference of City and County Health Officers, Portland, Ore., Sept. 16-17, 1930.

They consider any definite lesion *latent* when it does not give physical signs nor produce clinical symptoms. They have been able to follow up these cases for many years and in 1926 they first published their reports in which they predicted they could anticipate manifest clinical tuberculosis by finding of these latent lesions which come under the head of *apical infiltrations*. Late last year they republished their work, showing further observation and follow-up of their original studies, in which they claim to be fully justified in this anticipation of manifest clinical disease. Work based on this type of study has been carried out extensively in the state of Massachusetts, quite largely in the state of North Carolina and a few other places in addition to the district around Philadelphia.

I think this work fully justifies the intense study of the contacts of every open case of tuberculosis. In this study we must first apply the tuberculin test, preferably by the intradermal method, to determine those contacts which have been infected and then take roentgen films of the chests of those who react. The lesions found by these films will fall into three general groups. First is the primary nodule, which is of no special clinical importance unless it has developed; second, the tracheobronchial infiltration, or involvement of the tracheobronchial nodes to produce hilus tuberculosis, which is usually innocent so far as clinical manifestation is concerned, but in the more extensive cases is of definite importance; and third, and most important, the actual infiltration of the lung itself. This falls under the heading of the *childhood type of infiltration* which may occur in any part of the lung, not more often at the apex and usually under twelve years of age. The second is the apical or adult type of infiltration, occurring usually from twelve to eighteen years of age. This is the type which actually seems to anticipate manifest clinical tuberculosis.

PERSONAL HYGIENE AND SANITATION

More important than the detection of the case itself is the introduction of personal hygiene and home sanitation, especially directed to prevent the spread of tuberculosis. In fact, health authorities dealing with this subject have repeatedly said that the careful and educated case of tuberculosis is not a menace until he is so entirely helpless that he can not be depended on to carry out the rules which he knows to prevent spread of the disease.

Personal hygiene obviously centers around the care of the sputum, which involves the cough with its possibility of discharging droplets of infected material into the surrounding air. The care of discharges from other than pulmonary tuberculosis is a fairly simple matter, although it does require painstaking care in the handling and disposal of dressings. Health authorities advocate that we cover the cough and catch the sneeze, for various respiratory diseases are fitting in with that which we know is most important in tuberculosis, and I feel that every physician should promote this procedure at every opportunity. Every case of tuberculosis should be taught to cough into a piece of gauze, a paper napkin or other burnable material and to place this into paper receptacles, preferably sacks that can be burned frequently. Along with this they should be taught thorough oral hygiene.

With the control of the cough and sputum in mind we may scarcely mention the advisability of a separate set of dishes which are thoroughly scalded after each meal, and special attention to the personal clothing, bed clothing and other articles with which the patient may come in intimate contact. Every medical man knows and not a small number of laity are entirely conscious of the necessity of having any case of possible infectious disease sleep alone, and yet we should not take too much for granted and we should not hesitate to emphasize this point at any time that we are giving instructions. Only recently a boy, who was known to have tuberculosis and who had been under treatment for three or four years, with its various complications and who slept alone on a porch at home, went to visit a cousin and for more than a week shared his bed with him.

TREATMENT OF HOUSING QUARTERS

The importance of cleaning and renovating the living quarters is well known to every health officer and I know that if you had your way it would be a thorough job. It is a poor economic situation that does not permit, and in fact encourage, the thorough renovation of all living quarters that have been occupied by cases of tuberculosis. Rented quarters should not be permitted to pass from one to another without renovation, when they have been occupied by suspected or known cases of tuberculosis.

Our attention has frequently been called to the importance of washing all things that can be washed from these infected quarters, of a thorough airing and sunning of mattresses and other things which cannot be washed, of the thorough washing down of all surfaces which can be so treated, and of the renovation of all porous surfaces, such as those of paper or calcimine plaster. A thorough renovation, including resurfacing of all living quarters, should be constantly encouraged where there is the least suspicion of pulmonary disease.

The public should be made to understand the danger of occupying living quarters recently occupied by someone in poor health to the end that they will cooperate with health authorities in the detection of any possible cases of pulmonary tuberculosis.

CONCLUSIONS

Under the three main headings of detecting a case, personal hygiene and home sanitations, cleaning and renovation, I have attempted to cover the important things in preventing the spread of tuberculosis in the homes of this state. I venture that many of you can recall families who are said to be especially subject to tuberculosis and, if you have lived in Oregon long, you know of families where tuberculosis has passed down from one generation to another and in some instances has practically wiped out the family. You may also know of other families where it has involved a substantial number in a certain generation; sometimes even a majority have died with it and then the correction of conditions in the home has resulted in the disease coming to a dead stop or practically so, so that future generations have been apparently unharmed.

I believe it is a question whether adult tuberculosis arises mostly from childhood or some adult infection, but we know that a very substantial part does come from childhood infection and possibly a majority. Although I do not think we are ready to rule out adult infection altogether, whichever may be the case, the home is the most important center of attack, and more especially in this state.

Diabetic Lipemia Retinalis. Lillian A. Chase, Regina, Sask. (*Journal A. M. A.*, July 18, 1931), describes the thirty-seventh case of diabetic lipemia retinalis. The condition cleared up in seven days on insulin. Thirty-seven analyses of the blood for total lipids, total fatty acids and cholesterol were made. The blood lipids became normal in thirty-six days; the total lipids and total fatty acids dropped rapidly; the cholesterol dropped slowly and showed fewer daily fluctuations. The patient is now, one year later, 52 pounds (23.6 kg.) heavier than on admission, and is sugar free on 20 units of insulin daily.

THE FULL TIME HEALTH UNIT*

B. C. Wilson, M.D.
MEDFORD, ORE.

It is now a well established fact that the pendulum of modern medicine is taking a most decided swing to the side of prevention rather than the cure of disease. One of the most instrumental and most powerful causes of this swing has been the development of the modern health movement, and its most advantageous result has been the development and establishment of the full time health unit idea. The movement toward its establishment has received the fullest cooperation and assistance of the United States government, states, counties, cities, the medical profession and the leaders in thought of today. There can be no opinion to the contrary, that public health agencies, typified by the full time health unit, are the strongest link in the chain that joins the population of the United States and the medical profession in their struggle toward the prevention of disease and the rightful acquisition of the slogan, "America the healthy."

It is most gratifying to read in an article by the U. S. Public Health Service, entitled, "Extent of Rural Health Service in the United States," that of about 2500 counties which might be classed as essentially rural, 505 are governed by local health service under the full time health unit idea. It is true that this only amounts to about 24 per cent of the rural population of the United States provided with such health service, yet when we realize the greatly lower percentage so provided ten years ago, it encourages us in the belief that the health movement is steadily gaining momentum.

Let us consider that financial hazards have been removed and the full time health unit has been established. The pertinent question is the successful and efficient operation of the unit which depends entirely upon the enthusiasm and cooperation of the lay public, school officials, local government officials and the medical profession. The cooperation of the entire group above mentioned is necessary for success, as I feel that Abe Lincoln's statement, "United we stand, divided we fall," is truly the slogan of public health work.

I feel that the functions of a full time health department are divided in two general classes only, official and educational. Of course, we realize the entire work is in general educational but there are certain points on which all the force and authority of the law must be stressed. To my notion, the entire success of a health department depends on the proper form of health education and method and thoroughness with which it is put across to the laity. One of the easiest ruts a public health worker can slip into is the acquisition of a feeling of authority and the attitude of conceit which tends to divert one's activities from slow but sure health education to that of officious directing of the mode of living and environmental conditions. It has been my observation of various health departments that the ones doing the most good and were most successful were those that catered to the friendliness, sociability and equality of the laity and medical profession, yet persistently drove home health education when the occasion presented itself, while in the counties, in which health work was not making a gain and in many instances was losing, I noted the officious attitude predominant.

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* Read before the Annual Conference of City and County Health Officers, Portland, Ore., Sept. 16-17, 1930.

I would like to mention two impediments that stand in the way of the most efficient health work in Oregon.

First, is that ever present nuisance, medical care of indigents and prisoners. The health officer is seriously handicapped in his efforts to devote his best to health work by the large amount of time necessarily demanded by these services. The time is not far away when county courts and commissioners will so well realize this handicap to health work that they will relegate such services to the county medical societies or members thereof.

The second impediment is the lack of unification of health work and programs as a result of the existing state of affairs, whereby there are health officers appointed for counties and then we find two or more city health officers holding office in the same county, each man having different ideas as to what public health is, what should be done and how. Each county should have a state government of its own with one dircetor for the entire health program and work of that county. A part time health officer, whether for city or county, cannot engage in private practice and health work too without injury or slight to one or both of the tasks.

I shall now briefly skim over the set-up in Jackson County with a few words about some of our present practices and some ideas which I hope will soon be put into effect. We have a suite of four rooms, located on the second floor of the courthouse in Medford. One room is a modernly equipped dental clinic, furnished by the Jackson County Health Association, whose personnel consists of three local dentists, whose time is paid for by this lay organization, members of the latter assisting the dentists at their regular semiweekly afternoon dental clinics for school children. This clinic is now officially part of our department and our nurses are responsible for making appointments for the clinic children of their respective districts.

Another room is used as a supply room and contains a complete line of layettes, obstetric packs for home use, clinic setup materials such as nightingales, gowns, towels, et cetera, all furnished by the Jackson County Health Association. In this room we also store all of our records, literature, quarantine signs, stationery and such.

A third room is fully equipped in every detail for minor surgery, all examinations, venereal and other treatments. The fourth room is the office, containing desks for each of the three nurses, the secretary and health officer. In the office are also file cases, containing nursing records, laboratory records, water reports, vital statistics, epidemiologic cards, morbidity reports and correspondence.

In the office we have a large five by seven foot spot map, cases being spotted by use of colored pins. We also have a large graph board on which we hope graphically to depict the seasonal fluctuations of diseases. A large blackboard is used to depict the weekly and monthly score of diseases. We also have here a map of the county, showing the divisions of nursing services, school district boundaries and locations of schools.

In carrying out the official duties all tourist camps are inspected as per the state law. Complaints are investigated by the health officer and nuisances ordered abated where deemed necessary. The physicians of Jackson County are very cooperative about reporting diseases and every reported case is investigated personally by the health officer except in the cities of Medford and Ashland, where city health officers function. Every effort is exerted to rigidly enforce quarantine and keep accurate epidemiologic records.

Venereal disease control is lacking in Jackson County. We have the sheriff's office pick up all suspects that we hear about and try to see to it that they take treatments from their family physicians and desist from spreading the disease, or else they are sent where such treatment may be obtained. Many juveniles have been apprehended, especially girls, having venereal diseases and who were promiscuous.

It is with regret that I cannot boast of adequate regular inspection and examination of food handlers in Jackson County. I sincerely hope this will be instituted within the next year and certificates be issued. Due to the above activities, the name Jackson County Health Unit has been changed to Jackson County Health Department.

It is my opinion that the entire remaining activities of public health come under the heading Health Education. Our setup for this part of the program is excellent. We have the good fortune to have a county court that is thoroughly cognizant of the need and benefits of health work. Therefore, this court is all for us and backs us up in our work. The next great blessing we have is in the form of a powerful, well organized lay group, known as the Jackson County Health Association.

This association has local branches in ten communities over the county and is headed by a very energetic and enthusiastic health worker who as president inspires and sometimes prods the women who are members into such deserving health work that we realize, without such invaluable aid and assistance as they give us, health education would be at a very low ebb. The nurses always meet with the local branches of this association in their distracts and the health officer always meets with the entire group at its bimonthly meetings. Talks on our program and work with suggestions of ways to assist in health education are given by the health officer and the nurses, and are eagerly received and put into effect.

Besides such aid as above mentioned we receive actual financial assistance. Last September a third nurse was added to our staff, her salary and traveling expenses being paid entirely by this group. As before mentioned, they have given us a dental clinic and, too, they furnish milk, roentgenography, et cetera on positive or suspected cases of tuberculosis. This organization is a county branch of the Oregon State Tuberculosis Association.

We now hold seven regular monthly well-baby clinics. Members of the health association assist the health officer and the nurses at these clinics. Summer roundup clinics are also held, the setup being the same as for the regular clinics except that in these we stress the examination of preschool children. All of our clinics are well attended and are meeting with much favor.

Unfortunately, Jackson County is not endowed with a health minded education department and we realize the futility of attempting to reach school officials and school children through this source. This is a very unfortunate situation, as the only logical way to carry on adequate health education in the schools is through the county board of education which should be enthusiastically health-minded and insistent upon health training and health education being taught in the schools. Due to this situation, it is up to us to find a way to get around this hazard, and that is through the general public. Our nurses have been instructed to use no official attitudes as far as possible and for this purpose they do no quarantining or investigation of nuisances, etc. I feel that, if our nurses will learn to know every family within their districts, to be commonplace and sociable with them by making frequent home calls to the families, they can put over any health idea they wish. If we can gain the friendship and respect of the rural population through this method, it will be only a matter of time until this population itself will demand more service, advice and consideration from their health department.

The Health Honor Roll system for school children is flourishing in Jackson County. Attempt is made to examine all rural school children each year. Three types of slips are mailed to parents, giving suggestions for remedial measures to be taken for correction of defects noted. Of course, all suggest appointments with their family physicians or specialists. A red slip is sent for serious defects, a yellow for mild abnormalities and a white one for a clean bill of health. The white has on it the suggestion of regular future checkups to assure continuance of such a good condition of health. The health officer personally signs each slip to lend effect. The nurses place emphasis throughout the year on the program of obtaining the correction of defects found. On doing this, along with fulfilling certain school room requirements, as cooperation in health habits, making a passing grade in school and satisfactory deportment, the children are given health badges, are admitted to the Honor Roll and are given prizes, treats, talks, etc., as rewards for their interest in health. The children are very enthusiastic and cooperative concerning this phase of their work.

During the spring of 1930 we cooperated with the National and Oregon Tuberculosis Associations in putting on the "Early Diagnosis Campaign." Over 2200 intracutaneous tuberculin tests were given to school children. Less than 300 were given in the cities of Ashland or Medford, the remaining number being given to rural school children. We were proud of the fact that, in using 0.1 cc. of 1:10,000 solution of old tuberculin, we found only

214 positive reactors. Of the latter group 198 roentgenograms were taken and three active cases of the pulmonary type found or suspected. I feel this was a great piece of work as a diagnostic or preventive effort, but by far the greatest advantage was in the health education results. Due to lack of time we had to resort to post card notices to representative parents that children of their school would be given the test, and newspaper publicity.

In giving the tests we tried to cover every rural school and in each room I made a short talk telling the children what we would do and why, then assuring them they did not have to take the test, but I would give it to all who wished it and were interested. The great health education result I refer to was the satisfaction of seeing about 96 per cent of the children believe us about the need of it and the lack of pain in giving it, then in flocks roll up their sleeves to receive it. The next health idea we present to those 2200 children will be received just as eagerly because results show we have their interest, cooperation and good will.

This brings to mind again the Board of Education. We have a section in the rules and regulations of the Oregon State Board of Health that specifically states that all teachers must at the opening of each annual term furnish to the superintendent for the municipality or district, in which he or she resides, a health certificate from a registered physician certifying that he or she is free from tuberculosis or any other communicable disease. In Jackson County in the past this has not been carried out but the county board of health has insisted on it in the future. It seems a little foolish to me to work to make or keep children healthy, then placidly sit back and let some tuberculous man or woman come in intimate contact with the children six to eight hours per day, five days a week. But why stop at tuberculosis?

The latest device put into effect in the county has been the willingness of members of the health association personally to call on every family in their respective districts to obtain as complete data as possible on previous diseases, vaccinations or immunizations of members of that family, including the ages and names of all members. By this method we hope to spread the gospel of health through the health associations into every home in the county. These cards are to be filed in the school of the distract, where the children of these families attend, and will be of valuable assistance in cases of epidemics and for the checking and correction of defects.

The school boards of various districts have been sold to the idea of the necessity of school nurses and it is gratifying to note that one small school district has already appropriated $500 for the services of a quarter time school nurse to work in that school district twelve months in the year. We are looking forward to several other small school districts asking for such service. To expedite requests we are using politics to see if we can get various persons to start the ball rolling in each community and make them want it badly enough to ask for it. In closing, it may be mentioned that one of the ever increasing needs of Oregon is the services of more sanitary engineers or inspectors. This is especially true of Southern Oregon, where the rapidly increasing population demands more and more emphasis to be laid on enforcement of the rules and regulations concerning water supplies, excreta disposal methods, milk control, food handling establishments and food handlers.

CRITICISM OF PRESENT VOGUE. Eugene S. Kilgore, San Francisco (*Journal A. M. A.*, July 11, 1931), believes that hospital clinical histories are a good illustration of a valid general criticism of unrestrained standardization; namely, stereotypsm, perfunctoriness, mediocrity. As a remedy for this he makes the following general suggestions: 1. That one abandon the effort to amplify records for the purpose of future statistical researches except for the specific objectives in institutions where there is reasonable prospect of continuity and reliability of data to justify the effort. 2. That teachers and those who presume to examine hospitals for accrediting purposes shift the emphasis from form to content, that they recognize merit in any form in proportion as it aids in clarifying the individual case, and demerit in proportion as it exhibits aimless wandering, irrelevant matter, redundance, disjointing of related facts, or otherwise clouds the issue. Students should be shown the usual advantage of separate paragraphs on family and past history, and of the chronological order for recording recent events in the "present llness." They should also be encouraged to modify this arrangement when it can be done with advantage. 3. That the technic of history taking be regarded as an intellectual rather than a mechanical process. Histories should exhibit uniform clue-mindedness rather than a uniform system of headings and paragraphing. The record of important phenomena, such as weight loss, blood vomiting or edema, should show in the immediate context the effort to assemble the available historical evidence for or against the various possibilties suggested. Here is the legitimate place for negative statements, where they answer the reasonable curiosity of the intelligent reader. When not thus called for they should be generally omitted. Statements of doctors and friends, and treatments undergone, on which patients love to expand, should be kept out of the records unless they throw some positive light on the problem. But the clues should be followed with exhaustive thoroughness. It will be argued that such freedom in composition may be all right for mature clinicians but not for students; that the latter will overlook important data if they are not required to include all the conventional paragraphs. Of course they will; but so are they under the present burdensome regime; and it is better that they miss some of the kernels of grain while actually looking for them than that they miss them through being occupied by an elaborate sorting of the chaff.

HORACE CARPENTER, M.D.*
(1826-1893)

G. Horace Coshow, M.D.
SANTA BARBARA, CALIF.

Horace Carpenter, M.D., was the son of Dr. Lyman and Mary Carpenter. He was born in Connersville, Indiana, on the nineteenth day of December, 1826. Little is now known concerning his early boyhood days and a sketch of them must accordingly be brief. His primary education was received in his native state, but his higher education was obtained in academies in Indiana, Michigan and Iowa. He studied medicine at Keokuk, Iowa, in the medical department of the State University, where he graduated with honors in 1856 and received his M. D. degree. Postgraduate work was pursued at the Long Island College Hospital in Brooklyn, N. Y. He was known as a good student, painstaking, patient and methodical. "What he heard he weighed, reflected upon, digested and assimilated." After what was at that time a long course of thorough training, he was well prepared for the duties of his profession.

He began practicing in Scott County, Iowa, and was soon recognized as an able and accomplished physician. Although he did the work of a general practitioner, he preferred surgery, and in this he achieved success. "At the operating table he was never agitated, impatient or undecided, but always calm, self reliant and capable." It was while practicing in Iowa that he married Miss Sarah Coshow. To them were born six children, none of whom are now living.

When the Civil War broke out, Carpenter was mustered into the service of the United States Army as Assistant Surgeon of the First Regiment of Cavalry in the Oregon Volunteers. This brought him to Oregon in 1861 by way of the Isthmus of Panama. He was first stationed at Fort Haskins, near the present site of Corvallis, then at Fort Lappawi, Fort Stevens and Fort Yamhill, finally settling in Salem in 1865. So that he might become Surgeon of the First Oregon Infantry, an appointment tendered him by the Governor of Oregon, he was mustered out March 20, 1865, by order of Major General Irvin McDowell, commanding officer of the Department of the Pacific.

In that same year he settled in Salem and commenced a practice which resulted in a most successful professional career. It was here also that he became connected with Willamette University.

HORACE CARPENTER, M.D.
(1826-1893)

Under the auspices of the Methodist Episcopal Church, Willamette University was established at Salem, through the efforts of that early pioneer, Jason Lee, and his coworkers. The school, founded in 1842, was the earliest institution for higher education to be established in the Pacific Northwest.

While Dr. Joseph Henry Wythe was president of the University, the medical department was organized and approved by the Board of Directors, November 14, 1866, but a year passed before instruction began. Its establishment at that time made the medical department of Willamette University the second on the coast and probably the second west of the Mississippi River. The Medical School of University of California, then known as Toland Medical College, had been organized in 1865 at San Francisco and thus preceded the medical school at Salem by a year. However, the medical school at Willamette University maintained a continuous existence from 1867 to 1913, when it merged with University of Oregon Medical School, which Toland Medical College did not.

The first faculty of the newly established medical school was composed of physicians residing in or near Salem and to them goes the distinction of being the pioneer medical instructors in the Pacific Northwest. The personnel follows: Horace Carpenter, M.D., dean and professor of civil and military surgery; E. R. Fiske, M.D., professor of pathology and practice of medicine; John Boswell, M.D., professor of obstetrics and diseases of women, and children; J. H. Wythe, M.D., professor of physiology, hygiene and microscopy; D. Peyton, M.D., professor of materia medica and therapeutics; J. W. McAfee, M.D., professor of chemistry and toxicology; A. Sharples, M.D., professor of descriptive and surgical anatomy; W. C. Worimer, M. D., demonstrator of anatomy; Hon. J. S. Smith, professor of medical jurisprudence.

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* Senior Thesis, University of Oregon Medical School, Portland, Ore., May 15, 1930.

March 3, 1867, saw the first course of lectures started and three men received their medical degree that year at commencement. The second term began November 4, for it had been decided that instruction could be given more conveniently during the winter months. The course continued for twenty weeks and attendance at two courses of lectures was required for graduation.

Equipment for instruction in medicine was most meager and would be judged to be of little or no value compared to the established standards of today. The entire university was housed under one roof. The single building contained the college, the academy and all other departments. In it also room had to be made for the newly established department of medicine. Clinical facilities were scarce with a population of but 1200 in Salem and but 7000 in Marion County at that time. One must admire the courage and capability of such men who undertook to teach future physicians, considering how handicapped they were by their physical limitations.

Rivalries and jealousies developed the first year over the signatures which should appear on the diplomas of the graduating class. It appears that Dr. Carpenter objected to Dr. Wythe's signature appearing on the diplomas, but whether as a professor in the school or as president of the University is not clear. Relations became strained and Dr. Wythe submitted his resignation as president, but the matter was adjusted and he remained for another year. Regardless of the fact that disagreements developed from time to time within the faculty and between the faculty and the Board of Trustees regarding Dr. Carpenter's ability, he must have been competent, for he was always retained or reinstated after the fires of battle died out and not until 1875 did he resign, after having served seven years as dean and nine years as professor of surgery. Dr. Carpenter watched over the school with fatherly interest and care. The medical department may have had in its faculty men of greater power as lecturers and teachers than he but never one of higher and purer motives, never one of greater executive ability nor one so much admired by the students.

In September, 1874, the leading men of the profession in the state gathered at Willamette University and drew up the constitution and by laws organizing the Oregon State Medical Society. The charter members were Drs. Horace Carpenter, E. R. Fiske, C. H. Hall, T. J. Jessup, D. Payton, J. Reynolds, J. A. Richardson, L. L. Rowland, D. M. Jones, J. W. McAfee of Salem; C. Lindsey Hill, Albany; T. D. MacAurley, Stayton; A. J. Nickleson, Eugene; Alfred Kinney, and W. C. Warriner, Portland. Dr. Alfred Kinney was elected the first president and fifty years later, in 1924, he again had the honor bestowed upon him, the only man ever to serve twice as president of this society. Dr. Kinney, with Drs. C. C. Strong and Carpenter, were elected a standing committee or board of censors for all papers on surgery that were to be published.

At the next annual meeting of the society, Dr. Carpenter presented a case showing the result of an operation for the radical cure of a traumatic aneurism of the femoral artery. He read a paper on climatology and epidemics of Oregon and also reported an operation for an ununited fracture of the humerus. In part his paper stated that the ends of the bone were sawed off and united with silver wire. The wound healed over the wire which was not removed, and no evil results had followed after two years duration.

Dr. Carpenter became a member of the American Medical Association soon after graduating from school and had the honor during the year of 1881 to become one of the vice-presidents. He was a representative from a medical society in Iowa before coming to Oregon and twice a representative from the medical department of Willamette University to its convention.

The fifth annual meeting of the Oregon State Medical Society was held at Portland and Dr. Carpenter was elected president. It was at this time that Dr. Josephi, the first dean of University of Oregon Medical School, was elected into the society, and in 1882 he served on the executive board with Dr. Carpenter.

Dr. Carpenter presented a paper on hygiene as applied especially to ventilation and which was later adopted by the Board of Directors of the Public Schools of Portland.

In looking through the proceedings of the State Medical Society numerous instances are found in which Carpenter stressed the need for a Board of Health and Vital Statistics. In his address of welcome to the Society in 1881 he again brought up the fact that they were without a properly organized board of health but is was not until 1903, twenty-two years later, that a board of health was organized in Oregon.

Hodgkins and Galvins, in "Pen Sketches of the Representative Men of Oregon," state the following facts: From 1866 to 1870 Carpenter was visiting physician at the Oregon State penitentiary. When the insane asylum was built in Salem in 1883, he worked with the Board of Building Commissioners and superintended the arrangement of the ventilation, light, etc., with the view of having the details of each department complete. He showed a deep interest in the work and rendered valuable assistance to the Board, his suggestions being very valuable in that he, at his own expense, visited all the institutions of the character on the coast for the purpose of more thoroughly posting himself on the subject. At the completion of the asylum he served as superintendent and held that position until 1886, when he resigned.

In 1879 came the first publicly expressed opinions concerning state education in medicine, when Dr. Carpenter, in his presidential address before the Oregon State Medical Society, made the following statements:

"There ought to be a higher standard of preparatory education and a higher standard of attainment for the degree of Doctor of Medicine. The lowest standard in Europe is much higher than ours. In late years, however, there has been a gradual awakening on this matter and at this moment there is a demand all over the country for more thoroughness in medical education. Now, however, things are beginning to receive attention and the best medical colleges of the land are, one after another, yielding to the pressure of opinion and wheeling into line on the side of longer terms of study, longer courses of clinical training, and higher and more attainments.

"In view of the fact that this northwest country will not be able for many years to support more than one medical college, I suggest and recommend that this society do organize and establish, under the corporation laws of Oregon, a state institution to be called 'Oregon Medical College,' the faculty to be chosen as far as possible from the membership of the State Medical Society.

"For the purpose of meeting the requirements of the American Medical Association and relieving the faculty of the entire responsibility of the candidates for graduation, the State Society shall select four physicians of unquestionable integrity and ability, and of at least ten years experience in the practice of medicine and surgery, who shall constitute an advisory council to the college faculty and shall take part in the selection of that faculty as well as in the examination of all candidates for degree of Doctor of Medicine, and shall report their action annually to the State Medical Society."

From the above address one is forced to realize that those early pioneer medical men knew their shortcomings and were earnestly desiring and seeking after higher standards for their professional training as are the medical schools of today seeking still higher attainments.

Dr. Carpenter died in 1893, after sixty-seven years of active living.

Dr. A. J. Giesy, who is practicing medicine at the present time in Portland, was a student of Dr. Carpenter's in 1875. Of Dr. Carpenter Dr. Giesy recently said: "He was a good practical teacher and an outstanding surgeon at that time, which was before the days of Lister. He was well known throughout the state."

Dr. Kinney recently wrote concerning him: "He was considered Oregon's foremost surgeon, and from my point of view he was an all-around good physician and surgeon, painstaking, with confidence in his own ability, honest to the 'splitting of a hair,' and as able, reliable, industrious and as near up-to-date as a medical man of that day could be. He was a good neighbor, ready to give a helping hand to a poor devil just with the same earnestness as he would to the well-to-do. He always upheld his professional pride, and was always ready to help a professional brother out of trouble, regardless of remuneration. In fact, he seemed to care little for remuneration."

STUDIES IN THROMBOANGIITIS OBLITERANS (BUERGER). Samuel Silbert and Mae Friedlander, New York (*Journal A. M. A.*, July 4, 1931), treated fourteen typical cases of thromboangiitis obliterans with thyroid extract over periods of from four to eight months. Determinations were made at monthly intervals of the basal metabolism, chemical composition of the blood and clinical condition. Following administration of thyroid the low blood volume promptly increased to normal but fell slowly as the drug was continued. On withdrawal of the drug, the blood volume returned to the low figure first obtained. With increase in blood volume, the total proteins, calcium and cholesterol figures diminished to normal and again increased when thyroid medication was withdrawn. The observations demontrate that the low blood volume in cases of thromboangiitis obliterans can be raised to normal by administration of thyroid.

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Devoted to the Interests of the Medical Profession of the Pacific Northwest

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EDITORIAL

THE BLIND AND THE DEAF-MUTES

The presence of blind people and deaf-mutes is evidenced in every community but few realize the number of these unfortunates in the United States. The 1930 census gives a total of 63,849 persons reported blind, or 517 per million, and 57,084 individuals as deaf-mutes, being 465 per million. In our states of the Northwest are found of the blind 496 in Oregon, 792 in Washington and 165 in Idaho. The deaf-mute figures are 549 for Oregon, 746 for Washington and for Idaho 136. In addition there were reported in this country 1942 blind deaf-mutes, there being 19 in Oregon, 15 in Washington and 3 in Idaho.

One naturally inquires whether these handicapped persons are increasing in proportion to the population. The statistics as to this question are confusing. According to the report the blind in the 1920 census were 52,567 as compared with 63,489 for 1930, while the deaf-mutes were 44,885 at the previous census, compared to 57,085 in 1930. It is stated that ten years ago extra compensation for tabulating these unfortunates was not paid enumerators as has been customary in other enumerations, and it was believed that this may have had some effect in missing a large number who should have been included. Going back to previous census reports, further confusion is evident. The 1880 census was said to be the most complete that has ever been undertaken. That reported 976 blind per million population as compared with 517 in the last enumeration, and 675 deaf-mutes in contrast to 465 per million in 1930. It is evident, however, that many partially blind and partially deaf were included among these lists. Thus the question whether these classes of citizens are on the increase or decrease cannot be ascertained from these census returns.

An interesting observation is noted in connection with the returns for blind deaf-mutes. While the total of the last census was 1942, the enumeration for 1920 gave only 169. For Oregon and Washington the previous report gave only one each with none for Idaho. The census report offers no explanation for the apparently incredible increase of this class of unfortunates. This report gives no statistics concerning the many alleviating measures which are constantly carried on for the education and relief of this army of incapacitated individuals. One cannot but admire the persistent efforts exerted in teaching the blind to read and the deaf-mutes to speak. The sympathy and aid of everyone should be enlisted in an attempt to help these unfortunate members of our citizenship to approach as nearly as possible to the normal basis of life's activities and enjoyments.

THE IDAHO MEETING AT BOISE

The annual meeting of the Idaho State Medical Association will be held at Boise, Idaho, September 29-30. An interesting program is in preparation, including papers from members of the organization. These will be supplemented by papers from Drs. H. C. Naffziger, Clinical Professor of Surgery, University of California; N. W. Jones, Clinical Professor of Medicine, University of Oregon; R. C. Matson, Assistant Professor of Medicine, University of Oregon; F. B. Kistner, Portland; C. L. Lowman, Los Angeles; W. E. Stallings, U. S. Veterans' Hospital at Boise. In addition to a paper dealing with sterility, Dr. F. M. Loomis of Oakland will speak on State Medicine in Russia, illustrated with moving pictures from a visit to that country. In our next issue a complete program of this meeting will be presented with details of social entertainment and other features. It is believed this meeting will be of special interest not only to the Idaho profession but visitors from other states who may find it convenient to attend.

ANNUAL FALL MEETINGS

Interstate Post Graduate Medical Association of North America has announced the tentative program for its International meeting, which will be held at Milwaukee October 19-23. No medical meeting except that of the American Medical Association presents programs featuring such a multitude of speakers as this organization. Its president is Dr. Henry A. Christian of Boston and chairman of the program committee is Dr. George W. Crile of Cleveland.

The program includes addresses by the most distinguished members of the profession in this country in all branches of practice, beside representatives from Canada. Under surgery are listed twenty-nine surgeons, nearly all of whom are professors in the leading medical colleges of the land. Likewise under medicine are included the names of twenty-seven outstanding internists known to every practitioner, most of them being professors in medical schools. Under orthopedics, pediatrics, otorhinolaryngology, obstetrics and gynecology, and radiology are numbered four speakers each, all of whom are leaders in these different fields of practice. Ophthalmology, dermatology, urology, neurology and psychiatry are represented by one or two speakers, all professors in medical schools. Anyone might develop medical indigestion if he attempted to observe everything offered by such a program. He could, however, readily digest much of interest and value.

During recent years physical therapy has developed into an established specialty. The leading national organization in this line of practice is American Congress of Physical Therapy, which will hold its annual meeting at Omaha October 5-8. An outstanding feature of the meeting will be clinics and clinical demonstrations occupying all the mornings, with scientific papers scheduled for the afternoons. The clinics will be rendered possible by the cooperation of the University of Nebraska College of Medicine and Creighton University School of Medicine, both located in Omaha. The surgical clinics will feature electrosurgery for tonsils and the applications of physical therapy in the treatment of fractures and other orthopedic conditions. The medical clinics will emphasize physical therapy as applicable in the fields of pediatrics, gastroenterology and dermatology, special attention being paid to pneumonia. Massage, therapeutic exercise and hydrotherapy will be featured by specialists in these fields of practice. Any physician interested in this line of practice will be abundantly repaid by attending this meeting.

The American Urological Association has established a Western Branch, comprising the urologists of the Pacific Coast and Rocky Mountain states. Its annual meeting will be held in San Francisco November 6-7. Scientific papers, wet and dry clinics and a banquet with other social entertainment will comprise the program for the meeting. It is announced that the program of scientific papers will be of such a high character that all urologists on the Coast will feel the necessity of attending this meeting. The president of the Western Branch is Dr. Alexander H. Peacock of Seattle.

MEDICAL NOTES

OREGON

Oregon Wars on Antifat Remedies. Now that silhouette figures are out of style, we note that the Oregon state board of health is taking active steps to curtail the output of many so-called antifat products. Approximately forty brands have been taken by the federal government and found to be ineffective and unsafe.

Hospital to be Enlarged. The Veterans' Bureau has announced the addition to its priority list of the new administration building for the hospital at Portland. This will make available fifty more beds in that institution. Actual construction will be sometime in the future.

Surgeons' Fees Reduced. Surgeons' fees were reduced July 1 in state industrial cases according to a new schedule going into effect in Oregon. The explanation of the reduction is that, when rate advances were announced in April, many employers filed rejections of the schedule which were withdrawn with the reduction.

Oregon Medical Society. Committee members in charge of the program for the state convention of the Oregon State Medical Society in Eugene, October 22-24, are making interesting preparations. In addition to the scientific program, to be announced later, there will be a night football game on the schedule of the University of Oregon and the usual golf tournament and banquet. They are anticipating a large attendance.

Yamhill Physicians Organize. Last month the Yamhill County Medical Society was organized. The following officers were elected: President, J. G. Manning, McMinnville; vice-president, S. M. Wendt, Newberg; secretary-treasurer, Zielpha Galloway, McMinnville; Murch Russell of Sheridan, W. H. Burnard of Dayton, J. S. Rankin of Newberg were elected as the board of censors.

Clatsop County Medical Society held its regular meeting at the Astoria hotel, Astoria, June 17. Dr. Thomas Griffith and Mr. Clyde C. Foley, president and executive secretary of the Oregon State Medical Society, were entertained at dinner. They spoke on the scope of work being done by the state organization.

Dr. Lovejoy Honored. Dr. Esther C. Lovejoy, former city health officer of Portland, was elected president of the Medical Women's National Association at its recent annual meeting in Philadelphia.

Dr. W. E. Gregson of Arlington has been selected by the county court to fill the office of county health physician for Coos County. After graduating from McGill University he spent a year at Johns Hopkins and a year at Good Samaritan hospital, Portland.

Dr. R. B. King, recently of Los Angeles, has established offices in the Medical Arts Building at Roseburg and will limit his practice to laboratory and physical therapy work. He will likewise supervise the roentgen-ray and physical therapy work at Mercy hospital.

Dr. Edward N. Dunn, a 1926 graduate in pharmacy of Oregon State College and recently a graduate of the University of Oregon Medical School, is opening offices in Portland, following an internship at the Multnomah county hospital.

Dr. R. A. Verdier of Midland, Texas, an eye, ear, nose and throat specialist, has located in Corvallis to take over the offices and practice of Dr. E. V. Ullman, who is leaving for Europe in July.

Dr. J. Chris O'Day, formerly of Portland, who has practiced for fifteen years in Honolulu, visited his former home last month, having previously stopped at Seattle to attend the meeting of Pacific Northwest Medical Association.

Dr. Harold B. Gillis of Medford is to be associated with Dr. Swinney in the practice of medicine and surgery. Dr. Gillis has just completed a two years intern service in St. Vincent's hopital at Portland.

Dr. C. J. Ebner has recently located in the Smith Bldg., at Mt. Angel. He has recently completed a postgraduate course in eye, ear, nose and throat work.

Doctors Picnic. Members of the Jackson County Medical Society and their families held their annual midsummer picnic July 15 at Ashland Lithia park.

Dr. C. C. Newcastle of Portland has been made chief surgeon of the S. P. & S. Railroad and affiliated lines.

WASHINGTON

New Shriners' Hospital Authorized. Word from the national Shrine convention is to the effect that construction of the Shriners' hospital for crippled children will be started immediately. The site of the hospital will be on St. Luke's hospital ground at Spokane. A building fund of $50,000 is available at this time and the total cost will be approximately $75,000. The funds are derived largely from the annual Shriners' football game.

New Medical Structure for Yakima. Excavation work on the new Yakima Clinic building has already been begun. This is to be two stories in height and will represent an $85,000 investment when completed. The medical staff comprising the clinic is as follows: Drs. A. J. Helton, H. H. Skinner, W. L. McClure, G. W. Cornett, P. J. Lewis and J. A. Bline.

New Offices for Group. The Northwest Medical and Dental Group of Bellingham, announces the opening of their new suite of offices in the Herald Building. The group consists of Drs. F. C. Rykken, medicine and general surgery; Charles E. Tell, surgery and urology; John McGregor, obstetrics and pediatrics, and C. B. Hitz, dentist.

Appointment Announced. Dr. John A. Johnson, Tacoma, member of the Medical Reserve Corps of the army, has been promoted to the rank of lieutenant colonel, according to a recent war department announcement.

Yakima County Hospital in Trouble. Owing to a great increase in the demands for free services, the county commissioners of Yakima County state that the budget for charity and indigent relief is bankrupt. The basis for the situation is attributed to the fact that there has been a large increase in the amount of obstetric work demanded of them. Similar to the situation in other county hospitals, it has been found that many people resort to various means to get help for themselves and their families. A total allowance of $136,000 has been largely used up. Other counties throughout the state can feel with the Yakima people in this important matter.

Klickitat-Skamana Counties Society, at a recent meeting, elected the following officers for the following year: President, Dr. J. L. Harris, Stevenson; secretary, Dr. W. C. Trowbridge, Goldendale.

Stevens County Society has elected the following officers to serve during the coming year: President, Dr. H. F. Craig, Marcus; secretary, Dr. W. H. Gray, Colville.

Reappointed Health Officer. Dr. Marion Le Cocq of Lynden was reappointed county health officer of Whatcom County and county physician for the period beginning July, 1931.

Dr. William J. Mayo of Rochester, Minn., addressed groups of physicians throughout the Northwest en route to the meeting of the American Surgical Association in San Francisco.

Dr. Warner M. Harshner of Puyallup has left for Cambridge, Mass., where he will attend the summer session of the Graduate Medical School of Harvard University.

Dr. Patrick J. Gallagher, formerly of Spokane, has located in Seattle, where he will practice general medicine and surgery.

Dr. Joseph Coyle of Bremerton has returned after a period of study in the eastern medical centers.

Wedding. Dr. Edgar Lewis, intern at Swedish hospital, Seattle, was married June 25 to Miss Wilma Miles of New Plymouth, Idaho. Dr. Lewis is a graduate of the University of Oregon Medical School.

IDAHO

To Enforce Eugenics Law. Dr. R. L. Nourse, secretary of the state eugenics board and public health adviser, called a meeting of the state board for the purpose of proceeding with enforcement of the eugenics law passed by the state legislature in 1925 and amended in 1929. The law has been upheld by decision of the state supreme court. Announcement was made that several voluntary applications for application of the sterilization act under the law have been received.

A New Practice Group. Announcement from Pocatello is to the effect that Drs. C. W. Pond, W. F. Howard, D. D. Call, Richard Howard and B. C. McDougall have opened a large fourteen room suite of offices where they will continue their private practice.

Canyon Doctors Meet. Fifteen members of the Canyon County Medical Society attended the regular meeting at Nampa, June 22. Papers were presented by Drs. G. O. A. Kellogg and G. R. Proctor of Nampa.

Boise Doctors Form Partnership. Dr. Herald T. Nokes has formed a partnership with Dr. Alfred L. Budge at Boise, and will occupy a suite of offices in the Eastman Building.

Dr. W. W. Kettle of Joseph, Ore., has purchased the equipment and practice of Dr. William T. Drysdale of New Plymouth. Dr. Kettle is a native of New York and a graduate of University of Maryland.

Dr. B. A. Price, formerly of Chester, Montana, has located in Pocatello. For the past year he has been taking postgraduate work in Chicago and New Orleans.

Dr. J. F. Gist, formerly of Winchester, has located for practice at Lewiston after spending six months abroad in eye, ear, nose and throat study.

OBITUARIES

Dr. George Benson Kuykendall of Portland, Oregon, died suddenly Wednesday, July 22, at his home, aged 88 years. He was born near Fort Wayne, Ind., in 1843 and came to the Northwest by ox team in 1852. He was graduated in medicine at Willamette University in 1872 and after graduation accepted a position as government physician at Fort Simcoe, Yakima county, in the then territory of Washington. He was a student of Indian languages and folklore and had written extensively on these subjects. For practically forty years he practiced in Pomeroy, Wash., and retired in 1920 to live in Portland.

Dr. V. Gesner, aged 78 years, died at his home in Portland, Ore., July 4. He was born in Salem in 1852 and received his license to practice in Oregon in 1895. He was a graduate of Jefferson Medical College of Philadelphia. He was not actively engaged in practice at the time of his death.

Dr. Madison Jackson Gray, aged 78, died June 26 at his home in Portland. He was a native of Tennessee and a graduate of the school of medicine at Vanderbilt university, Nashville, in 1881. In 1903 he moved with his family to Roseburg and practiced there for thirteen years. Since 1916 he has resided in Portland.

Dr. Patrick J. Scallon, aged 69, died at his home in Port Angeles, Wash., July 16, after a year's illness. He was born in Quebec, Canada, in 1862 and attended Mount Royal and St. Mary's College at Quebec. He was graduated from the Michigan College of Medicine at Detroit in 1885. He practiced for a short time in Wisconsin and Nebraska and then came to Idaho, where he practced at Coeur d'Alene for over thirty years. He at one time served as a regent to the University of Idaho. He had recently moved to Port Angeles, where he died.

Dr. George W. Hoxsey, aged 71, died July 3 at Wenatchee, Wash., following two years illness. He was a graduate of the American Medical College of St. Louis, Mo. He came to Washington with the Great Northern survey in 1889 and is reported to have been the first doctor in the Wenatchee valley. He had been in the service of the Great Northern Railroad for more than forty years.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

A Clinical Study of Addison's Disease. By Leonard G. Rowntree, M.D., and Albert M. Snell, M.D. Division of Medicine, The Mayo Clinic and The Mayo Foundation, Rochester, Minnesota. 12mo of 317 pp., with 41 illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $4.00 net.

In presenting his original and now classic description of Addison's disease, the great clinician reported eleven cases of this extremely rare malady. In four the cause was thought to be carcinoma of the adrenals but this etiology is now discredited. Anemia was stated to be a prominent feature of the disorder but in the accepted sense this is untrue. In the broader meaning Addison was correct for, if the blood is not deficient in quality, it is diminished in volume, particularly in the dangerous crises.

The authors of the present monograph have selected for their study 108 authentic examples of the addisonian syndrome from some 300 cases at The Mayo Clinic diagnosed during life, or showing lesions after death, significant of Addison's disease. Eighty patients have been under their personal care.

Addison's original description is given in full, and also the historic events, that have led to our fuller knowledge of the disease in the seventy-five years since its discovery, are recorded. Then follow detailed clinical and pathologic reports of thirty-one cases that have come to autopsy. Among these the adrenals were tuberculous in twenty-six cases and the subjects of atrophy in five. There is an interesting chapter on atypical cases, such as entire absence of pigmentation, hypertension in the earlier stages, and various complicating diseases clouding the diagnosis. At present five of the author's patients are in relatively good condition more than five years after the onset of the disease; two have survived seven, and one twelve years. These patients all responded successfully and at once to the Muirhead treatment.

The authors affirm that Addison's single sentence describing the disease still stands authoritative and undimmed by the lapse of time and experience: "The leading and characteristic features of the morbid state to which I would direct attention are anemia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach and a peculiar change in the color of the skin." Very important additions to this list of symptoms are marked hypotension and loss of weight. The duration of the malady is from six months to two years, occasionally from two to four years, and rarely from five to nineteen years. The long standing cases are those due to atrophy of the suprarenals rather than to tuberculosis. Complete recovery from Addison's disease is unknown. Respiratory infections resembling influenza sometimes herald the onset of the disease or occur in the crises and all patients are peculiarly susceptible to infection, exposure, stress, strain and drugs.

The average blood pressure is 96 over 67 but normal tension and even hypertension are not rare. One patient had a systolic pressure of 140 till a few hours before death. On the other hand, a systolic pressure below 80 is serious, and below 70 is critical, while patients rarely recover with a systolic pressure of 60.

Thirty pounds represents the average loss of weight, chiefly due to vomiting, anorexia and digestive disturbance. Conversely, the best index of general improvement is a gain in weight. Patients do not appear to have become emaciated because the skin remains elastic but muscular atrophy is marked. Pigmentation of the skin and inside the mouth, excluding those of negroid blood, Indians, Greeks and Eurasians, is the most valuable single sign of Addison's disease. Among Lewin's reported authentic cases sixty-four were without pigmentation. The reviewer diagnosed a case as Addison's disease not long ago, confirmed later by autopsy, in which all pigmentation was absent.

A chapter is given to the most careful minute clinical and laboratory study on the effects of Addison's disease on the various organs of the body. While evidence of tuberculosis was present in one-third of the cases from history alone, yet the tuberculin test proved of no value in diagnosis, being often negative. An interesting roentgen technic has recently been developed at The Mayo Clinic, by which diagnostic shadows of calcified areas significant of tuberculosis have been found in four out of eight cases of Addison's syndrome. The differential diagnosis in relation to pigmentation in the dark races is most difficult and sometimes impossible, but is ably discussed in all its aspects. Chronic tuberculosis, neurasthenia and postinfluenzal exhaustion offer special obstacles in diagnosis and patients may need prolonged observation.

Complications of all sorts, more often tuberculous, including lesions of the kidneys, testes, spine and glands, besides concurrent diseases, are not uncommon and demand a correct diagnosis, since surgery is generally fatal in Addison's disease. Long continued pigmentation is regarded as rather a favorable sign. Also cases of leutic origin offer a more propitious outlook unless they are given antisyphilic treatment. Sudden deaths are not uncommon and relatives must be prepared for the event, often precipitated by unusual stress or strain, infection or even by a powerful purge. Crises occur, suggestive of those seen in exophthalmic goiter, with constant emesis, failing kidneys, oliguria and low specific gravity, accompanied by blood urea retention.

Treatment is discussed in meticulous detail and the use of the Muirhead treatment, by which 56 per cent of the patients have been more or less benefited. Enormous interest now centers in the aqueous extract of the suprarenal cortex of Swingle and Pfiffner that maintains suprarenalectomised cats indefinitely. In the crises of Addison's disease it appears to be almost as life-saving a measure as insulin in diabetic coma. So far sufficient extract has not been available to test this substance over long periods of time.

The incidence of Addison's disease and diabetes insipidus is about the same, i. e., one case occurs in every six to seven thousand patients in the large hospitals, both very rare instances of endocrine disorder. The book closes with a complete bibliography. The Rowntree and Snell monograph is a splendid painstaking study of a most interesting and fatal disease and, as such, reflects great credit on the authors and The Mayo Clinic in furnishing such an enviable abundance of material not to be found elsewhere.

WINSLOW.

HUMAN BIOLOGY AND RACIAL WELFARE. By twenty-eight authors. Edited by Edmund V. Cowdry, Professor of Cytology, Washington University, St. Louis. Illustrated. 612 pp. $6. Paul B. Hoeber, Inc., New York, 1930.

"The papers presented in this volume report the results of investigation in a great group of sciences vitally affecting man. They are intended not only to give a general background and perspective to students of special sciences, but also to give to the average intelligent layman some knowledge of the present state of learning in these several branches of knowledge and to give him some idea of the bearing of the various specialties upon man and the possibilities of his further development. This book is one answer to the lament of H. G. Wells, when he says, 'If only the scientists would tell us *less mumblingly* what it is all about!' "

The book is divided essentially into two parts. The first deals with the origin of man and man as a physiologic unit, while the second part takes up the effects of environment and the future of man. Medical interest centers largely in the latter part of this study in the problems of disease control.

Primarily, the book deals with evolution. Two facts of evolution must be borne in mind before it can be intelligently discussed. These are that it has occurred in the past, which is an irrefutable fact, and that there is no evidence whatsoever to show that it has occurred in the age of civilization. The reviewer was impressed by the logical presentation of the facts of evolution, but he was likewise struck by two points of weakness in the present conception of this theory. First, the origin of the first spark of life has not been satisfactorily explained. Evolutionists reject spontaneous generation and substitute the paleogenetic theory. In the mind of the reviewer this is merely another name for spontaneous generation. If one defines life as the ability to reproduce one's kind, it is not plausible to assume that protoplasm through a process of condensation of amino acids could spontaneously originate, and in that spontaneous origin acquire the power of reproduction of its own kind by its own ability in the future, and without the aid of those physical factors which first brought it into being. The second weakness in the theory lies in the development of sentient beings from an organism which did not possess cognative faculties. This is supposed to have occurred recently in the evolutionary process, and at a time when this had markedly slowed down and was almost at a point of cessation. It impresses the reviewer as strange that the almost infinite step in the evolution of man from a nonintelligent to an intelligent organism should occur so rapidly at a time when the least amount of physical changes in the evolutionary scale were in effect.

LIEBLY.

DISCOVERING OURSELVES. A View of the Human Mind and How it Works. By Edward A. Strecker, A.M., M.D., and Kenneth E. Appel, PH.D., M.D., 306 pp. $3.00. The Macmillan Co., New York, 1930.

The authors believe that the public has been led to appreciate the value of physical hygiene, but they need more education in the understanding of mental hygiene. It is, therefore, "to the realization of the constructive potentialities of the human mind" that they dedicate their treatise.

So much has been written the past few years on the subjects of psychology and mental hygiene that at first thought one wonders if there is any excuse for another book on these subjects at this time. The bulk of the mental hygiene literature, however, deals with children, stressing the importance of correcting conduct disorders and faulty habits of thought. This volume, on the contrary, is obviously written for the adult, to enable him to understand the why and wherefore of his conscious and subconscious conflicts and to help him to properly adjust himself to life.

The authors have had much experience in the clinical application of their knowledge and in the impartng of it to others. This book is a clear, logical and wholesome exposition of the subject matter. It is divided into two parts. (1) conceptions of modern psychology and (2) the psychology of every day life. The conflicting urges of thought, feeling and action are discussed. Regression, extroversion, introversion, rationalization, repression and the other usual ways of meeting conflicts are separately discussed, until the reader is brought to the final chapter on sublimation.

Throughout the book case reports are inserted to illustrate the text, but so briefly and interestingly as not to interrupt its continuity. Little diagrams, some of them quite amusing in their simplicity, aid in explaining the subject matter to the uninitiated layman. This volume can be read with profit by both doctor and patient. PRICE.

PROCTOSCOPIC EXAMINATION AND THE TREATMENT OF HEMORRHOIDS AND ANAL PRURITUS. By Louis A. Buie, B.A., M.D., F.A.C.S., Section of Proctology, The Mayo Clinic, Rochester, Minnesota, and Associate Professor of Surgery, The Mayo Foundation, University of Minnesota, Minneapolis, Minnesota. Octavo of 178 pp., with 72 illustrations. Philadelphia and London, W. B. Saunders Company, 1931. Cloth $3.50 net.

This monograph is a concise, well illustrated review of the methods used in the rectal department of The Mayo Clinic. In addition there is a chapter on caudal and sacral anesthesia which is strictly up to date. The author's surgical method of operating on the severer types of hemorrhoids is more or less original and is undoubtedly superior to the Whitehead operation which it replaces.

His method of treating pruritus with extensive subcutaneous injections of alcohol, while it is undoubtedly efficacious, could hardly be used in private practice except upon the gravest types of cases, in which every other method has been a failure. This little book deserves a place on the shelf of everyone interested in proctologic work. It is a relief to read a scientific presentation of this kind after some of the half-baked ideas and openly plagiaristic dissertations on this subject with which we have been afflicted.

CROOKALL.

MEDICAL JURISPRUDENCE. A statement of the Law of Forensic Medicine. By Elmer D. Brothers, B.S., Ll.B., Lecturer Emeritus of Jurisprudence in the Medical and Dental Department of the University of Illinois, etc. Third edition. 309 pp. $3.50. The C. V. Mosby Co., St. Louis, 1930.

This is a very elementary treatise on medical jurisprudence. The preface states that the work is not intended for lawyers and the reviewer can not see much in it that would help the medical practitioner. The subject of insanity is treated in three chapters. The first has as a beginning a quotation of poetry. The subject-matter has many non-English quotations and the classifications of insane conditions are more for a non-medical man. The subject of Christian science is an example of the use of words without any practical help to be derived by the medical practitioner, if he should care to take the time to read it. The reviewer is of the opinion that the book is of little practical value to the physician. COPPS.

FOOD ALLERGY. Its Manifestations, Diagnosis and Treatment, with a General Dicussion of Bronchial Asthma. By Albert H. Rowe, M.S., M.D., Lecturer in Medicine in the University of California Medical School, San Francisco, Calif., etc. 442 pp. $5.00. Lea & Febiger, Philadelphia, 1931.

A book which causes the reviewer to buy it before he has finished the first chapter is worth while. The sanity of the author and his careful avoidance of untenable ground, together with the completeness and the scientific presentation of the rather difficult subject, recommend this work to the critical physician. The chapter on diagnosis is especially complete and emphasizes food elimination trials as of great value, both as an adjunct to skin testing and as an independent method in the face of negative skin tests. Elimination diets are discussed in detail, and any physician can improve his results in the treatment of patient with food allergies simply by following the instructions laid down.

The relation of food allergy to those conditions long accepted as of allergic origin, namely, eczema, urticaria, angioneurotic edema, generalized edema, bronchial asthma, perennial hay-fever, and the multitudinous affections of infancy and childhood, is well discussed. Less commonly considered conditions, as allergic toxemia, migraine and neuralgia, arthritis and arthralgia, dysmenorrhea, Henoch's purpura, Meniere's syndrome, epilepsy and psychic disturbances, are given due consideration. Rather unexpectedly, a good case is made out for the diagnosis of bladder allergy. An excellent bibliography completes the book.

G. A. DOWLING.

AMERICAN PHYSICIANS AND SURGEONS. A Biographical Directory of Practicing Members of the Medical Profession in the United States and Canada. Including Supplements in Which are Listed and Classified Leading Hospitals, Sanatoriums and Health Resorts of Both Countries. Prepared by James Clark Fifield, Editor of *The American Bar*. 1737 pp. $30.00. The Midwest Company, Minneapolis, Minn., 1931.

According to the foreword of this publication, "American Physicians and Surgeons is offered as a biographical directory of contemporary members of the medical profession, who are, at the time of going to press, in active practice in the United States and Canada, and who, by reason of their high attainments, skill and reliability, are especially entitled to inclusion in such a book." The names compiled herein were assembled by representatives of this publication who visited various cities of the United States and Canada, endeavoring to determine those entitled for inclusion by reason of their attainments in special lines of practice. It is stated that doubtless some names are omitted which are entitled to inclusion. The author states that the book is intended especially for information to laymen who desire it as a guide to aid them in securing competent, safe and reliable medical services. The sketch of each physician listed recites his sources of general education as well as medical, his intern experience and additional sources of education previous to establishment in practice. A section is devoted to hospitals and health resort, with mention of detailed management, size, facilities offered and other desirable information. The volume presents voluminous information concerning listed physicians as well as other medical matters which will be of interest to all having access to it.

TEXTBOOK OF PHYSICAL THERAPY. By William Benham Snow, M.D., Past President of American Physical Therapy Association, etc. Illustrated with 183 Text Cuts. 708 pp. $10.00. Scientific Authors Publishing Company, New York. 1913.

The author of this volume was one of the best known physical therapists both in this country and abroad. He was a pioneer in this line of practice, having followed it

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continuously for more than thirty years. He was held in high esteem by a host of students in different parts of the world. This volume is presented in three sections. The first, occupying about half the book, deals with the constant and static currents, the second section considering high frequency current, the third presenting electrosurgery. The author has been a leading advocate for the use of the static current, employing it with enthusiasm in a great variety of conditions. After presenting a historical sketch of its therapeutic evolution, the characteristics and care of the machine are discussed with a description of its physiologic effects and general applications. Numerous chapters consider the treatment of a large variety of diseases, enumerating customary forms of therapy, supplemented by the application of the static current. Some physical therapists will question the adaptability of this current to some of the diseases under consideration. The author cites many cases in which this agency was employed, with the technic of its application and results obtained. Anyone interested in the administration of the static current will find a wealth of material in this volume relative to its application in a great variety of pathologic conditions. The section dealing with high frequency outlines its application to many forms of disease. Many case reports supplement the description with quotations from the experiences of other writers who testify to the therapeutic results obtained from the employment of this agency. The section on electrosurgery reviews the various applications of the high frequency current for the removal of benign and malignant neoplasms as well as its use for the relief of many other conditions. Any practitioner who devotes attention to physical therapy will find much of interest in this volume.

CRIPPLED CHILDREN. THEIR TREATMENT AND ORTHOPEDIC NURSING. By Earl D. McBride, B.S., M.D., F.A.C.S. Instructor in Orthopedic Surgery, University of Oklahoma School of Medicine, etc. One hundred Fifty-nine Illustrations. 280 pp. $3.50. The C. V. Mosby Co., St. Louis, 1931.

This book is intended primarily for the nurse but it is also a source of reliable information for the social worker and the parent. The work takes up all of the various orthopedic conditions with an explanation of the cause and treatment. The subject of braces, plaster casts and shoes are well covered and the book is very profusely illustrated. As a textbook for nurses or a guide for social workers it is useful but for the mother with a child having but one orthopedic condition to care for it is necessarily too brief to be of benefit. BRUGMAN.

HEMORRHOIDS. THE INJECTION TREATMENT AND PRURITUS ANI. By Lawrence Goldbacker, M.D., Philadelphia. Second revised edition. 207 pp. $3.50. F. A. Davis Co., Philadelphia, 1931.

This is a very elementary treatise on the author's method of treating internal hemorrhoids and pruritus ani. It contains nothing new except in the quantities of phenolized oil used at one injection. He claims originality for the use of as much as 10 cc. of phenolized oil in one hemorrhoid. Different authorities, who have been treating certain types of hemorrhoids by this method for the last decade, seem to get satisfactory results with from one to three cc. of the solution. After the treatment of over 1000 cases by this method the reviewer has yet to find a hemorrhoid which will not give the test for sufficient solution with less than five cc.

The new instruments offered by the author present nothing new or of value. His speculum is a cross between a Martin and Brinkerhof and by the combination destroys the essential values of each. The nature of the chapter on surgical anatomy can be appreciated from what he has to say about the rectal crypts. "Their function is supposedly the secretion of a lubricant to aid the passage of feces through the anal canal." And the columns of Morgagni, "it is said that they help guide the feces into the anal canal." In fact, the reviewer can see no use for the publication of this book, unless to give the medical profession another view of the very nice prints which were mostly taken from the work on "Diseases of the Rectum and Colon" by A. B. Cooke, and issued by the same publishers in 1914. CROOKALL.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued Serially, one number every other month.) Volume 14, No. 6, and INDEX VOLUME. (New York Number—May, 1931.) Octavo of 300 pages with 55 illustrations. Per Clinic year, July, 1930, to May, 1931. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

A group of leading New York internists present clinical reports on a large variety of subjects. Five of these deal with bacterial infections, two discussing acute bacteremias, others dealing with bacterial endocarditis, bacterial pneumonic infection and intestinal infection. Loeb considers manifestations of rheumatic fever in relation to the newer concepts, while Goldstein discusses gonorrheal arthritis. Sturtevant discusses the medical treatment of peptic ulcers, detailing the dietary for a period of three months. He states that he had obtained over 80 per cent of cures. His patients are ambulatory, which he considers an advantage over bed treatment. Every internist will find much of profit in this volume of clinical reports.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 11, No. 3. (New York Number—June, 1931.) 239 pages with 73 illustrations. Per clinic year (February, 1931, to December, 1931) Paper, $12.00; Cloth, $16.00. Philadelphia and London; W. B. Saunders Company, 1931.

This issue from the Lahey Clinic comprises reports from fourteen members of that organization. Special subjects receive particular attention. Thus, there are eight clinical reports on various forms of disease affecting the digestive tract from the salivary ducts to the colon. Six clinical discussions appear pertaining to the diseases of the thyroid gland and surgical procedures connected therewith. One may obtain valuable suggestions as to surgical treatment and technic concerning conditions of disease from perusing these reports.

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THE DIAGNOSIS AND TREATMENT OF ACUTE INTESTINAL OBSTRUCTION[*]

OWEN H. WANGENSTEEN, M.D.
MINNEAPOLIS, MINN.

The practical application of Lister's momentous discovery of antisepsis made surgery of the abdomen possible. Under the aggression of the surgeon's knife, the mysteries of the abdomen were unfolded and the various disorders to which the abdominal viscera fall heir became quickly classified. Since the dawn of that new era in surgery the results of operative intervention of election as well as of necessity have exhibited striking improvement, due in large measure to better surgical technic and to earlier recognition of abdominal disease.

Early entry of the abdomen by the surgeon has robbed acute appendicitis of many of its terrors, and it is a matter of common lay and medical knowledge that deaths in this disease are largely due to late recognition of the ailment. In the early days of abdominal surgery, perforations of gastric and duodenal ulcer were regularly attended with a formidable mortality. Today, even though the mortality of such disasters commands attention and respect, it is known that the mortality varies directly with the number of hours lost between the occurrence of the catastrophe and the closure of the perforation.

The complication of acute perforation in ulcer would appear to be potentially a far greater menace to life than the existence of interference to the continuity of the intestine by an adhesive band. Actually, however, the danger incurred by a patient with bowel obstruction, as judged by the comparative mortalities of these two disasters, is at least twice as great. The risk to which a patient with acute intestinal obstruction is liable is equal to that borne by ten patients with acute appendicitis. The threat to life in acute intestinal obstruction today would appear to be almost as great as it was forty or fifty years ago. Statistics indicate that 40 to 60 per cent of patients operated upon for acute bowel obstruction die. In a series of 1,000 cases operated upon at various hospitals for intestinal obstruction, reviewed by Gibson[1] in 1900, the mortality was 43.2 per cent. Van Beuren and Smith,[2] in 1925, published a collected report on 1089 operations for bowel obstruction performed since 1900 with a mortality of 41.8 per cent.

When the subject of bowel obstruction was discussed at an early meeting of the American Association of Physicians and Surgeons held in this country in 1888, the medical views were presented by Reginald Fitz[3] and the surgical opinions by

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[*] From the Department of Surgery, University of Minnesota.

[*] Read before the Ninth Annual Meeting of Pacific Northwest Medical Association, Seattle, Wash., June 25-27, 1931.

[1] Gibson, C. L.: A Study of 1,000 Operations for Acute Intestinal Obstruction and Gangrenous Hernia. Ann. Surg., 32:486. Oct., 1900.

[2] Van Beuren, F. T., and Smith, B. S.: The Status of Enterostomy in the Treatment of Acute Ileus. Arch. Surg., 15:288. Aug., 1927.

[3] Fitz, R.: The Diagnosis and Medical Treatment of Acute Intestnal Obstruction. Trans. of the Congr. of Am. Phys. and Surg., 1:1. 1888.

Nicholas Senn.[4] A large number of recognized medical authorities participated in the discussion that ensued and the consensus of opinion was that only when two days trial with conservative measures had proven futile should recourse be had to surgery. Today it is universally conceded that operation should be done for the relief of acute bowel obstruction as soon as the diagnosis can be made. Despite this acknowledgment, cases come to operation almost as late as when two days were devoted to conservative measures. That delay in recognition is responsible in large degree for the shocking mortality of acute intestinal obstruction is evidenced by a number of statistical studies which indicate that, when cases come to operation early, the results compare fairly satisfactorily with the issue attending the surgery of other acute abdominal catastrophes.

Finney[5] reports a mortality of 36 per cent in 217 cases but within the first twelve hours it was 5 per cent, and for the twelve to twenty-fourth hour period 11 per cent. Whereas the mortality in the entire group of 128 cases of acute intestinal obstruction reported by Tuttle[6] was 41.3 per cent, in 13 cases operated upon within six hours, there were no deaths and in the 25 patients, operated upon within twelve hours, the mortality was 4 per cent. In 124 cases reported by Brill,[7] the mortality for the group was 36.3 per cent, but of the 17 cases operated upon within the first twelve hours there were no deaths, and of 16 cases operated upon between twelve and twenty-four hours, 12.5 per cent died.

In 1926 Holden[8] of Portland reported 135 cases of intestinal obstruction with a mortality of 19.2 per cent. Of these 51 came directly to Holden. There were only three deaths in this group, a mortality of 6 per cent, made possible by early recognition of the presence of obstruction and prompt surgical relief. The key to better results in the treatment of intestinal obstruction is early diagnosis.

PHYSIOLOGIC CONSIDERATIONS

The results of a large number of experimental investigations have indicated that the absorption of a toxin, producing profound and overwhelming effects on the organism, is largely accountable for the prohibitive mortality of acute obstruction. Clinicians have been quick to seize upon the toxin absorption theory, finding in this refuge some solace for their misgivings and a satisfactory explanation for their poor results. Since the discovery of Hartwell, Hoguet and Beekman[9] that the subcutaneous administration of saline may permit a dog with complete obstruction of the upper intestine to survive for as long as three weeks, our ideas concerning the mode of death in obstruction have undergone considerable change. It was first believed that the saline acted as a detoxicant but later, when the temporary administration of physiologic saline solution proved to be equally as efficacious in the prolongation of life following the experimental establishment of complete obstructions high in the intestine, this idea had to be abandoned. More recently White and Fender[10] have been able to secure a similar prolongation of life in high obstructions by bringing the distal loop out to the skin and placing the regurgitated content into it.

It is now well established that saline acts in the manner of a specific in high experimental obstruction, not in the sense of an antidote for absorbed toxins, but in that it serves as an adequate substitute for essential fluids lost by vomiting. When saline is not given, death usually occurs within three or four days, and a marked increase in the blood nonprotein nitrogen, a decrease in the blood chloride and an increased combining power of the blood for carbon dioxide (alkalosis) obtain. The administration of saline precludes the occurrence of these alterations in the blood chemistry. Dogs with complete obstruction in the lower colon frequently survive for comparatively long periods (40 to 50 days). The usual cause of death is dehydration and starvation. The administration of saline does not prolong their lives and blood chemistry alterations are usually not observed. There are many features of the problem in bowel obstruction that are still imperfectly understood, but it would appear that there is a fairly direct correlation between the function of the part of the intestinal tract concerned and the cause of death.

There is no concrete convincing evidence which indicates that death in obstruction to the continuity of the intestine, in which the bowel wall remains viable, is due to absorption of toxins from the bowel. There exists, however, considerable negative evidence in which no proof of abnormal absorption has been obtained. Similarly in strangulating types of obstruction, as long as the peritoneal coat of the bowel remains intact and bowel rupture has not occurred, the mechanical features of loss of blood and serum into the infarcted bowel and transudation of fluid into the peritoneal cavity serve adequately to explain the condition. Owing to the presence of proteolytic organisms within the lumen, such a bowel deprived of its blood supply rapidly undergoes autolysis and necrosis of its wall with threatening inundation of the peritoneum with highly septic and toxic material.

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[4] Senn, N.: The Surgical Treatment of Intestinal Obstruction. Trans. of the Congress of Am. Phys. and Surg., 1:43. 1888.

[5] Finney, J. M. T.: Acute Intestinal Obstructon. S. G. and O., 32:402. May, 1921.

[6] Tuttle, H. W.: The Mortality of Intestinal Obstruction. Boston Med. Surg. J., 192:791. Apr. 23, 1925.

[7] Brill, S.: The Mortality of Intestinal Obstruction. Ann. Surg., 89:541. April, 1929.

[8] Holden, W. B.: Intestinal Obstruction in 135 Cases. Arch. Surg., 13:882-886. Dec., 1926.

[9] Hartwell, J. A.: Hoguet, J. P., and Beekman, T.: An Experimental Study of Intestinal Obstruction. Arch. Int. Med., 13:701. May, 1914.

[10] White, J. C., and Fender, F. A.: Cause of Death in Uncomplicated High Intestinal Obstruction; Experimental Evidence to show that Death is not Due to Toxemia but to Loss of Digestive Fluids and Salts. Arch. Surg., 20:897-905. June, 1930.

Factors, such as loss of vital fluids by vomiting, interference with absorption from the bowel and the local mechanical effects of distension upon the viability of the bowel as well as upon respiration and heart action, account satisfactorily for the devastating results of obstruction to the continuity of the intestine. In strangulating types of obstruction the added feature of blood loss just referred to above is an important item in bringing about a shock-like state. It cannot be denied that a toxic factor may play a role in the production of the chain of events in bowel obstruction, but in the presence of a bowel with its peritoneal coat intact, such an assumption is still demanding of proof.

PATHOLOGIC CONSIDERATIONS

Classification: From the point of view of a pathologic division there are essentially two types of intestinal obstruction, viz., simple and strangulation obstructions. In the former group are included all cases in which a block in the continuity of the bowel exists; in the strangulation group are those which exhibit, in addition to a mechanical block, evidence of deprivation of blood supply to the intestine.

The bowel wall above the obstructing mechanism is distended, hyperemic and thinned out in obstructions of an acute nature. Fluids and gas accumulate in the proximal segments in large amounts. The bowel distal to the obstruction is anatomically normal. The imprisoned loop in well developed strangulation obstruction is infarcted, exhibiting discoloration and signs of tissue death. In simple obstruction to the continuity of the bowel, in which the distension is great enough to impede the egress of venous blood from the intestine, the phenomena of devitalization as observed in strangulation obstruction may ensue. This occurrence is not infrequently observed in the cecum, consequent upon the enormous distension of the colon occasionally accompanying carcinomatous obstruction in the sigmoid flexure. As a consequence, distension ulcers, perforation and gangrene may follow, as are regularly observed in nonviable strangulated segments.

CLASSIFICATION OF INTESTINAL OBSTRUCTIONS

A. Mechanical
  I. Narrowing of lumen
    1. Strictures of bowel wall
      a. Congenital { Atresia
        Imperforate anus
      b. Acquired { Inflammatory
        Traumatic
        Vascular
        Neoplastic
      } Simple
    2. Obturation
    3. Compression from without (especially pelvis and retroperitoneal duodenum)
  II. Adhesive bands { Congenital
    Inflammatory
    Traumatic
    Neoplastic
    } Simple or strangulation
  III. Hernia
    1. External—strangulation (with only few exceptions)
    2. Internal—strangulation (usually)
  IV. Volvulus—strangulation
  V. Intussusception—strangulation
B. Nervous
  I. Inhibition ileus (paralytic) adynamic—simple, occasionally strangulation
  II. Spastic ileus (dynamic)—simple
C. Vascular
  I. Thrombosis and embolism of mesenteric vessels
  II. Severance or injury of mesenteric vessels (operative or blunt trauma) strangulation

From the point of view of causative factors, three main types of intestinal obstruction may be recognized, viz., mechanical, nervous and vascular. This division furnishes an adequate and satisfactory clinical classification, into one of which categories any observed variety of intestinal obstruction may be easily placed. By far the larger number of instances of obstruction are due to mechanical agents, such as adhesive bands, hernia, neoplasms, intussusception and volvulus.

In the newborn, atresia of the intestine, imperforate anus, hernia of the bowel through a congenital defect in the mesenetery and volvulus of the intestine due to failure or incomplete rotation of the bowel are the common causes of obstruction. In infancy and childhood intussusception is the most commonly observed type of bowel obstruction. Obstruction due to new growths is observed in later life. Adhesions and hernia, which account for so large a group of cases of bowel obstruction, though observed at any time of life, occur most frequently between the extremes of age. Statistically, obstruction due to adhesions and hernia are the most frequently observed varieties. In England, Denmark and Australia, intussusception constitutes a fairly large proportion of all cases of intestinal obstruction and is observed far more commonly than in other quarters. In Russia and Serbia volvulus is the most frequent type of obstruction observed. Whereas volvulus in most series accounts for less than 10 per cent, reports from Serbia and Russia indicate that it is responsible for more than 50 per cent of all cases of bowel obstruction observed.

DIAGNOSTIC FEATURES OF BOWEL OBSTRUCTION

The criteria upon which the diagnosis of intestinal obstruction is usually made are the following: pain, nausea and vomiting, obstipation, meteorism and collapse. All of these symptoms may be observed at some time during the course of the obstruction, but usually at not sufficiently early an hour to afford the patient remedial help.

FACTORS CONTRIBUTING TO DELAY IN DIAGNOSIS

1. *Absence of local physical findings*: Unlike other acute surgical lesions of the abdomen, simple obstruction of the intestine produces no local signs that help to corroborate the suspicion that obstruction may be present. Appendicitis, biliary colic and perforation in the gastrointestinal tract occasion definite physical findings that are of immense value in deciding the nature of the condition present. The recognition of the existence of acute inflammation of the vermiform appendix without the occurrence of local tenderness and rigidity would enhance the difficulties of diagnosis enormously; the number of cases coming to operation with peritonitis would be manifoldly increased, should such difficulties exist.

The significance of local physical findings in establishing the presence of an acute surgical lesion is attested in the value of such findings in strangulation of external hernias. Bower[11] found that, whereas a group of strangulations of external hernias came to operation in 37 hours after the onset of symptoms, in obstructions within the abdominal cavity this interval was 76.6 hours, or 177 per cent greater.

Undoubtedly the absence of definite local physical findings more than any other factor accounts for the delay in the recognition of simple bowel obstruction. Were this point continuously borne in mind, the occurrence of crampy intermittent pain without abdominal tenderness would not be so lightly considered. At the same time, the absence of local symptoms should be of distinct diagnostic value, inasmuch as it obtains in no other serious surgical emergency that affects the abdominal viscera.

2. *Mistrust in enemas.* A diagnostic criterion, upon which too much emphasis has been placed in the recognition of acute bowel obstruction, is the inability of the patient to expel gas or feces following the administration of an enema. There exists a general tendency to disbelieve the presence of a complete obstruction as long as gas or feces continues to be returned with the enema. It is not an uncommon thing to see patients admitted with enormous intestinal distension, in whom operation has not been advised because of the continued expulsion of gas after enemas.

In the experimental laboratory it was found that, even after complete division and inversion of the ends of the intestine, enemas were returned with gas as long as there was any present in the distal bowel. By placing balloons in the bowel distal to the obstruction, it was noted that the peristaltic activity compared favorably with that of the normal. The bowel distal to the obstruction is physiologically as well as anatomically normal. Why should not the bowel distal to the obstruction expel gas or feces following the administration of an enema? In high obstructions gas will continue to be expelled as long as rectal irrigations are given, and in partial obstructions as long as some of the content of the bowel proximal to the obstruction finds it way into the distal segments (figs. 1 a, and 1 b).

It is, of course, a good plan to give enemas when a patient is suspected of having obstruction, and I like to observe the following plan in their administration. An enema, preferably of soap suds, is first instilled into the rectum and a responsible attendant is present to evaluate the results. Should the patient expel gas and feces but pain continues, another enema, usually a Noble's, is given twenty to thirty minutes later. If intermittent pain continues, even though gas is expelled, and the other signs point to the presence of an obstruction, operation is urgently indicated. The evacuation of gas and feces does not militate against the presence of bowel obstruction.

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[11] Bower, J. O.: The Cause and Prevention of the Increasingly High Mortalty in the Acute Surgical Abdomen. Am. J. Med. Sc., 174:225. Aug., 1927.

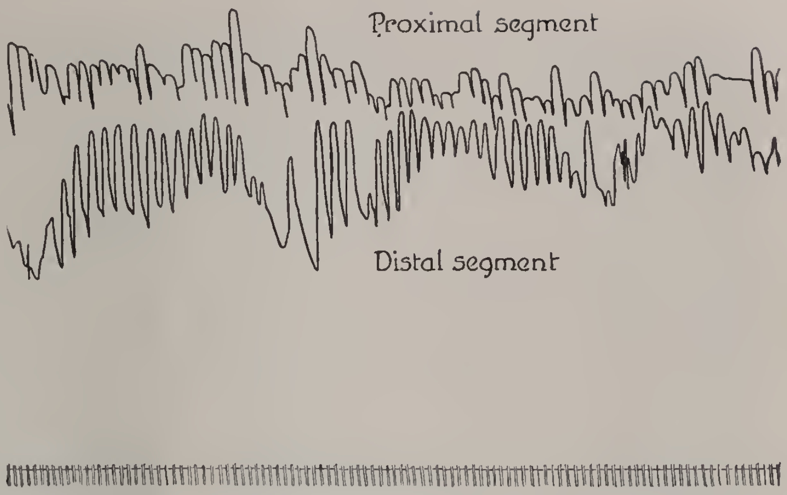

Fig. 1, a. Drawing from a tracing obtained by placing small rubber balloons into the bowel proximal and distal to the point of obstruction. The contractility of each segment of intestine is equally great. The fallacy of considering the bowel distal to the obstruction inactive is apparent.

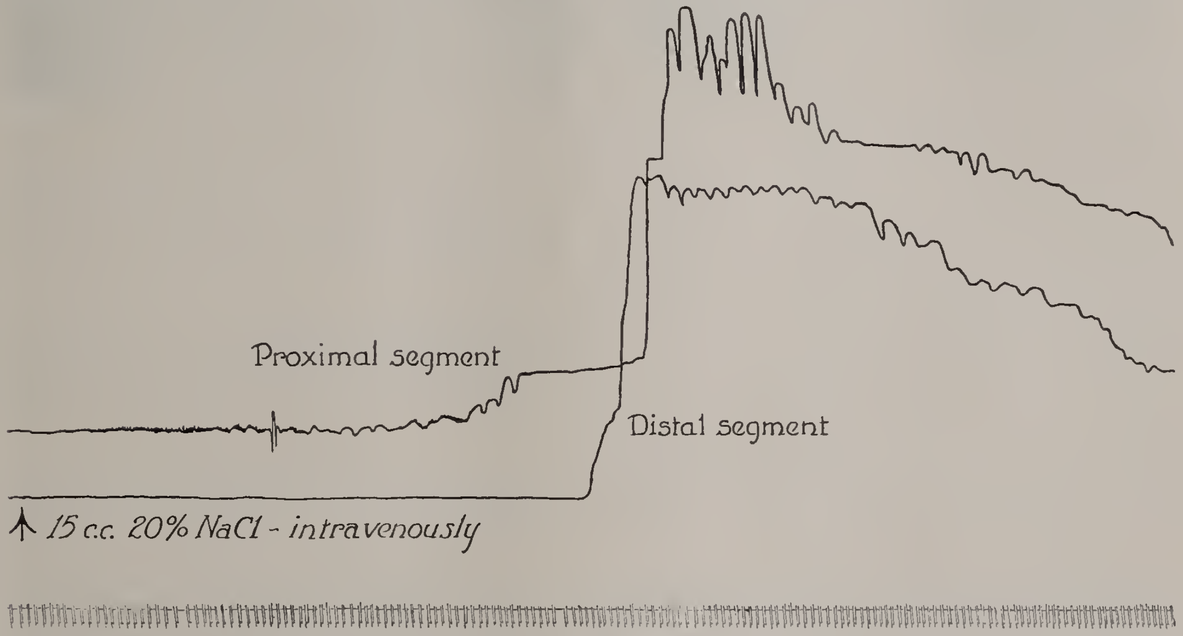

Fig. 1, b. The effect of intravenous injection of hypertonic solution of sodium chloride. The response in the bowel distal to the obstruction is the same as in the proximal.

3. *Danger of morphine.* A serious evil in the management of all acute abdominal disorders is the administration of morphine before the diagnosis has been made. Frequently both patient and physician are pleasantly lulled into a sense of temporary security by this disease and the significant sentinel warning of intermittent colicky pain is silenced until physician and patient are apprized by the increasing distension, regurgitant overflow vomiting and other sinister warnings that bowel obstruction is present, but, also, too late to undo the harm wrought by the irremediable delay. Even following the administration of morphine, however, loud intestinal borborygmi may be heard on auscultation of the abdomen, significant of abnormal peristaltic activity of the intestine. Morphine enhances the tone of the normal as well as the obstructed bowel, but when pain is gone the significance of loud intestinal borborygmi is difficult to evaluate.

4. *Deception of apparently effectual catharsis in partial obstruction.* Occasionally one hears the oral administration of a vigorous laxative such as castor oil vaunted as an important aid in determining the necessity for operation in bowel obstruction. In suspected postoperative obstructions, many surgeons place considerable significance on the results of such catharsis in deciding whether or not obstruction is present. Not infrequently unreliable information is obtained through this practice. Not long ago the equivocal information imparted by this test again came to my attention.

About a week after the removal of an acutely inflamed appendix and an ovarian cyst encountered incidentally, the patient complained of unusually severe "gas pains" which were attended with vomiting. A mechanical adhesive type of obstruction was suspected but when the ingestion of castor oil failed to aggravate the pain and was followed by the evacuation of small amounts of gas and feces, and enemas proved equally as efficacious, it was felt by her medical attendants that no interruption to the continuity of the bowel existed. Only after several days elapsed, during which time distension gradually increased and the vomiting became regurgitant in character, was it appreciated that a partial obstruction was becoming impassable.

That it is decidedly unsafe to continue the expectant treatment in incomplete obstructions of an acute nature is a matter of common knowledge among surgeons of experience. Somewhat more than five years ago I had the humiliating experience of losing a patient through the belief that a partial obstruction was well tolerated.

A mechanical obstruction developed in a young boy of eight years five days following an operation for diffuse peritonitis having its origin in a ruptured appendix. The boy, whose condition was desperate, was operated upon rather hurriedly and several adjacent loops of the jejunum were found adherent to the anterior abdominal wall. These attachments were separated, but four intestinal fistulas developed in the loops adherent to the abdominal wall. Some months later the segment of intestine concerned was excised and an intestinal anastomosis made. The immediate convalesence was without untoward event, but slight vomiting and intestinal distension persisted. Unfortunately, too much emphasis was put upon the evacuation of a stool following the oral administration of castor oil and the appearance of ingested charcoal in the feces. The unfortunate lad died twelve days after the establishment of the continuity of his intestine from a partial obstruction. The night before, an explosive-like expulsion of gas and feces had been obtained following the administration of pituitary extract. A postmortem examination indicated that a secondary enterostomy would have replaced failure by success.

Today when operating for the closure of small intestinal fistulas, when the slightest doubt exists concerning the unobstructed continuity of the intestine below the fistula, I always perform an enterostomy above the intestinal anastomosis. It serves as an adequate safety vent, and if clamped for a few days before removal of the catheter, reliable information is obtained concerning the continuity of the distal intestine. The administration of castor oil is not a satisfactory guide in the diagnosis of acute bowel obstruction nor is the reaction of the intestine a reliable index as to whether operation is indicated.

CRITERIA UPON WHICH THE DIAGNOSIS OF BOWEL OBSTRUCTION MAY BE MADE EARLY

The occurrence of intermittent colicky abdominal pain, in a patient presenting no local physical findings, is strongly suggestive of obstruction to the continuity of the intestine. Too frequently, postoperatively, the pain factor is not given adequate consideration in evaluating whether or not a mechanical obstruction exists. Often such patients after having denied the presence of pain, if interrogated concerning occurrence of gas pains, express themselves forcibly and freely about this complaint.

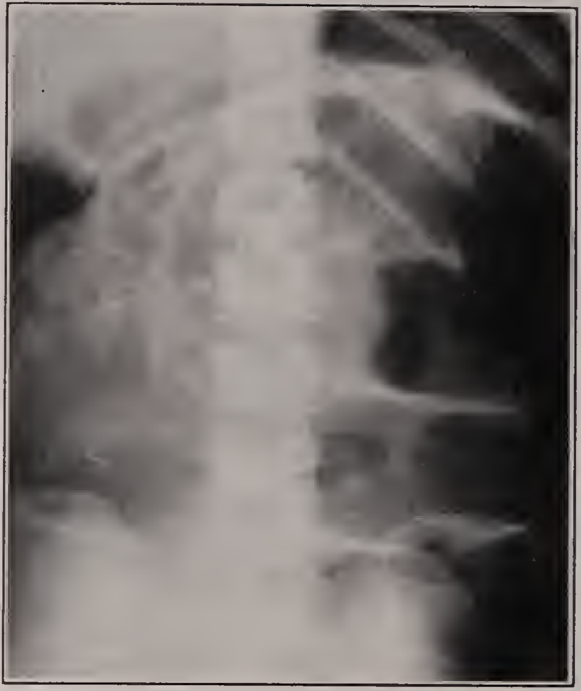

Fig. 2. "Step-ladder" pattern of small bowel in a patient with late intestinal obstruction. At the height of the crampy pains of which the patient complained, loud gurgling noises were heard on auscultation. The enormous distension of the intestinal coil is apparent. Small calcified mesenteric lymph nodes are visible in the upper left abdomen. The patient recovered after simple enterostomy.

THE STETHOSCOPE

Auscultation of the abdomen often lends the most valuable of all physical signs of obstruction. Visible peristalsis, though regularly present in subacute and chronic obstructions, is rarely observed in acute bowel obstruction. Its presence is synonymous with hypertrophy of the bowel wall. Loud peristaltic rushes, like the bubbling sound produced by pouring water out of a bottle, may be heard with the stethoscope when a mechanical obstruction exists. A dilated intestine in which considerable fluid and air are present is necessary to elicit these bubbling sounds. Near the point of intestinal occlusion these intestinal noises may attain an explosive force. Frequently a metallic tinkle may be heard, a sign of conclusive significance for the existence of a bowel under tension. As the fluid and air are carried downward toward the point of obstruction by peristaltic rushes, their progress is suddenly arrested and fluid and air which are intimately mixed in their advance tend to separate

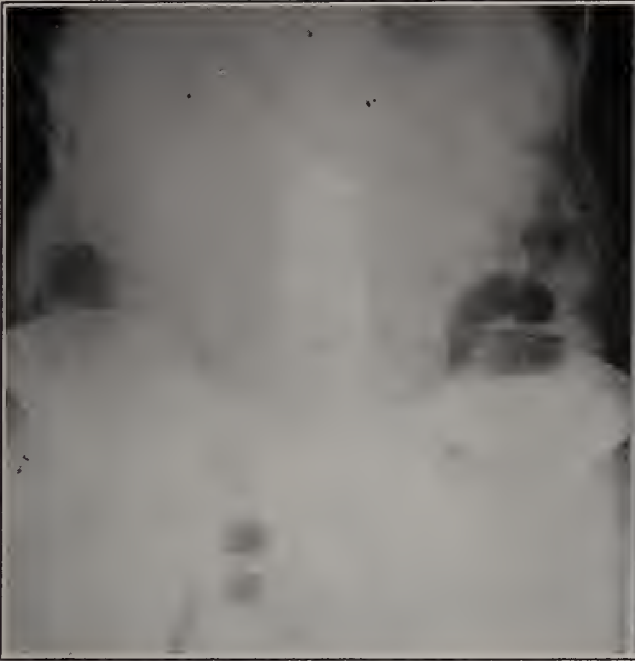

Fig. 3 a. Gaseous distention of a short loop of small intestine on the left side of the abdomen in a patient with acute intestinal obstruction of seven hours' duration. A loop of small intestine adherent to the anterior abdominal wall was found near this side.

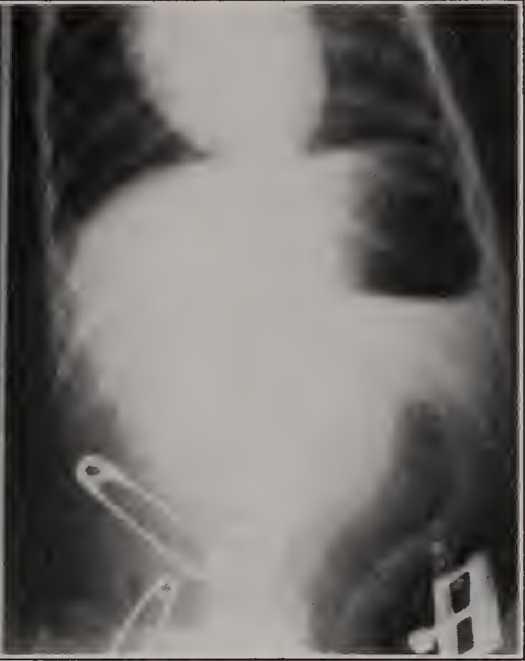

Fig. 3 b. Gaseous distention of small intestine four and a half hours after the small intestine had been obstructed in the lower ileum.

as the onward movement is halted. As the air rises to the surface, a sound like drops of water falling in a rain barrel may be heard. The metallic character of the sound has a high pitch, imparted by the tension of the dilated intestine. Loud intestinal noises with maximum intensity at the height of the pain corroborate strongly the suspicion of mechanical occlusion. The coincident occurrence of gurgling sounds and intermittent pain is very significant. Only colics of the intestine are heralded by crampy pain and concomitant loud gurgling noises.

ROENTGENOGRAPHIC EVIDENCE

It has long been recognized that roentgen rays are of value in detecting the presence of bowel obstruction, but this agent has not been accorded the importance it deserves in the diagnosis of acute intestinal obstruction. As long ago as 1911, Schwarz[12] of Vienna described the presence of gaseous shadows in the small bowel, and indicated their significance in the diagnosis of acute obstruction. He, however, was unwilling to commit himself to the diagnosis unless corroborative evidence was obtained by the administration of an opaque contrast medium. In 1914, Case[13] described the significance of these gaseous shadows for the presence of bowel obstruction, and has since been insistent in emphasizing the value of this aid in diagnosis. Kloiber[12] was the first, in 1919, to indicate that the diagnosis of bowel obstruction could be made on the presence of these gaseous shadows in the small intestine alone, and stated that the administration of barium was not necessary (fig. 2).

It is well known that, when a plate is made of the abdomen of the adult, gaseous shadows are observed in the stomach and colon. Gas is also present throughout the small intestine, but the intimate admixture of gas and fluid in the small bowel precludes distinguishing the gas from its immediate surroundings. The demonstration of gas in the small intestines on the roentgenographic film is, therefore, decidedly abnormal and is indicative of the presence of a mechanism interfering with the normal rapid rate of transit through the small intestines. The ladder pattern described by Case as a typical picture of bowel obstruction need not be awaited to make the diagnosis. Visible collections of gas in the small intestines of the adult are synonymous with intestinal stasis*

In the experimental laboratory it has been found that definite roentgenographic evidence by the single plate method may be obtained within four or

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[12] Schwarz: Die Erkennung der tiefen Dunndarmstenose mittels des Roentgenverfahrens. Wien. Klin. Wchnschr., Nr. 40. 1911.

[13] Case, J. T.: Roentgen Studies after Gastric and Intestinal Operations., J. A. M. A., 65:1628. Nov. 6, 1915.

[14] Kloiber, H.: Die Roentgendiagnose des Ileus ohne Kontrastmittel. Arch F. klin. Chir., 112:513. 1919.

* Gas is regularly observed in the small intestine of the infant and child until two years of age.

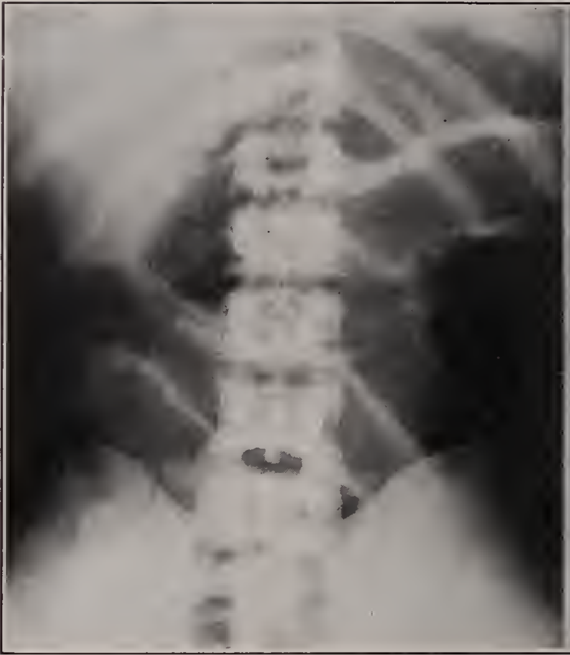

Fig. 4 a. Distended coils of intestine in a patient with peritonitis. The relatively thick intestinal walls between the dilated loops suggest the presence of exudate between them. This abdomen was silent on auscultation. The peritonitis had its origin in a suppurative appendicitis for which the patient was successfully operated upon.

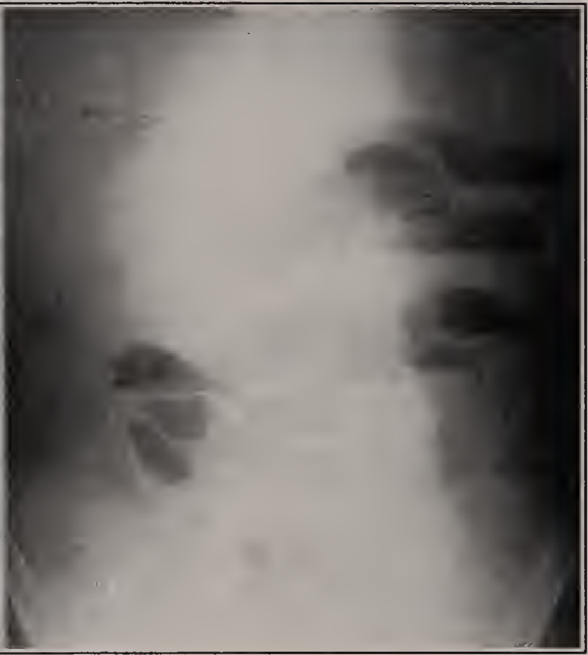

Fig. 4 b. The same in standing posture; the accumulation of gas over fluid gives the appearance of fluid mirrors. Visible gas in the small intestine in the adult is synonymous with intestinal stasis. The stethoscope tells whether it is mechanical or paralytic in character. The degree of intestinal distension is better determined in the plate taken with the patient supine.

five hours after the establishment of simple obstruction in the small intestine. When the obstruction was made in the descending colon, the time of appearance of gaseous shadows in the small intestine was a variable factor, and was usually not observed earlier than after eight to ten hours (figs. 3 a, and 3 b). A few cases of malignancy in the pelvic colon causing acute obstruction have come to my attention, in which no gaseous shadows were visible in the small intestine, despite enormous distension of the colon. And I have gained the impression that in a patient with acute bowel obstruction, suspected of having a malignancy in the colon, the absence of gaseous distension of the small intestine strongly favors a carcinoma of the sigmoid flexure, at which site the majority of malignant obstructions in the large bowel occur.

When the exposure is made in the standing posture, gas is visualized over fluid, giving the appearance of "fluid mirrors." If the patient is too ill to stand, he may be turned on his side and fluid levels may as easily be demonstrated as when he is erect. The plate made in the prone or supine position, however, gives the most valuable information. From this plate alone the degree of distension and the location of the distended coils can be most easily made out. However, the surgeon cannot depend on finding the obstructing mechanism at operation exactly where it would appear to be on the roentgenographic film. Nevertheless, the localizing evidence afforded by the location of the distended coils designates better than any other method whether the obstruction is high or low in the small intestine.

The oral administration of barium is to be deprecated in all cases of acute intestinal obstruction, for the diagnosis can be made without its use. Frequently, in instances of acute intestinal obstruction when given, it fails to leave the stomach and it oftentimes takes considerable time before the barium goes down far enough in the small intestine to be of any value in locating the point of obstruction. It is far safer to locate and determine the nature of the obstruction at operation, at which time it can be done with much less risk to the patient.

The determination of whether the visualized gas is in the large or small bowel is occasionally a difficult matter. Gas in the small intestine is characterized by its central location; the long axis of the shadow is transverse and, when the loops are considerably dilated, the two intestinal walls separating adjacent loops are seen as a very thin and narrow wall. The occurrence of a fairly thick wall separating greatly distended loops suggests the presence of fluid or exudate between the loops. Gas at

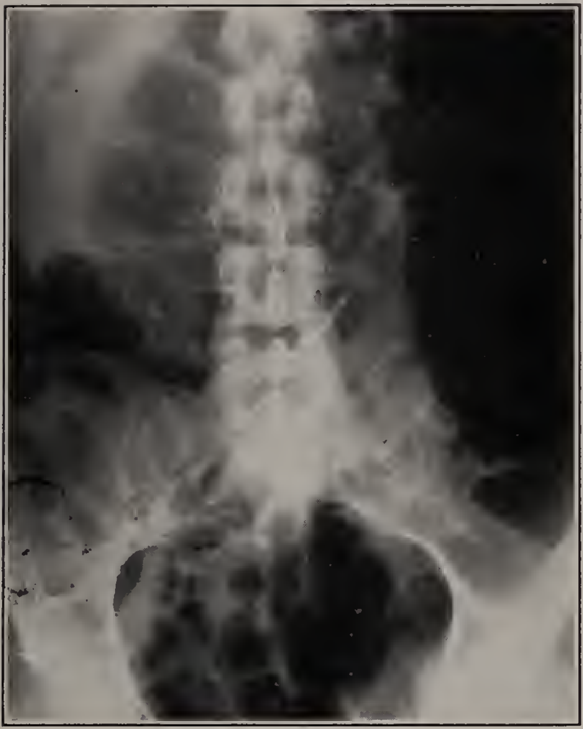

Fig. 5. Intestinal distention limited almost entirely to the colon. The patient had been operated upon six times elsewhere for intestinal obstruction. Clinically she presented all the features of a mechanical obstruction, viz., "gas pains and loud intestinal noises at the acme of the colic." The limitation of the distension to the colon and the stomach (not shown here) suggest a functional spastic type of obstruction.

the lateral borders of the abdomen is ordinarily in the colon; the long axis is usually vertical and the intestinal walls are thicker and haustral markings are occasionally in evidence. The typical appearance of the gaseous shadows in the obstructed small intestine may be described as a step-ladder arrangement of the coils; the mucous folds of Kerkring within the bowel lend a feathery appearance. However, it must be emphasized that this step-ladder-like arrangement is not necessary to make the diagnosis. Visible gas in the small intestine of the adult in synonymous with intestinal stasis (figs. 4 a and 4 b).

The stethoscope serves to distinguish the type of intestinal stasis. When mechanical in nature, the occurrence of intermittent, crampy, colicky pain associated with loud intestinal borborygmi establishes the obstruction as mechanical interference with the continuity of the intestine. If, however, gas is distributed throughout the colon as well, and the abdomen is silent on auscultation, it is almost a certainty that the obstruction is paralytic in character.

How many lives would be saved by the more frequent employment and judicious use of these two simple agents, the stethoscope and the roentgen-ray! In many instances the diagnosis can be made over the telephone. The story of a previous operation with the occurrence of intermittent colicky pain, attended with nausea and vomiting but no local tenderness or rigidity, are as suggestive of bowel obstruction as the pain, food-relief sequence in duodenal ulcer. The verdict of the roentgen-ray determines whether intestinal stasis is present and the stethoscope tells whether it is mechanical or inhibitive (paralytic) in character.

There are a group of cases, fortunately small, which may lead to confusion. We all recognize these patients when they do not present the symptims of bowel obstruction. They have considerable difficulty with gaseous distension and exhibit in high degree the features of a neurogenic complaint with reference to the bowel. I have seen seven such patients in whom the clinical picture in every way simulated an organic obstruction of the bowel. They complain of intermittent crampy pain, at the height of which loud intestinal noises may be heard on auscultation. They exhibit usually considerable distension and vomiting is a prominent feature. The roentgenographic film of the abdomen, however, indicates that the gas is practically entirely in the colon and stomach. If a mechanical obstruction in the pelvic colon such as a carcinoma of the sigmoid flexure can be ruled out, the presence of gas in the colon contradicts the presence of a mechanical obstruction. Following the administration of enemas with an organic obstruction in the small intestine, the gas in the colon would have disappeared. I have come to place so much reliance on the significance of the presence of the gaseous distension of the colon in such cases, that I believe they can be identified by this criterion, despite the other manifest signs of a mechanical obstruction (fig. 5).

In the trying situations that occur in the immediate convalescence after operation, when it is debated whether a paralytic ileus or an adhesive obstruction is present, the stethoscope and roentgen-ray are equally as dependable agents. Postoperative obstruction due to adhesions invariably concerns the small intestine. Roentgenographic examination in its presence reveals gaseous shadows in the small intestine with an empty colon. The stethoscope indicates the mechanical nature of the obstruction. Paralytic ileus would be heralded by a uniform distension of colon and small intestine on the roentgenographic film, and a death-like silence on stethoscopic examination of the abdomen.

The employment of the roentgen-ray to determine the degree of intestinal distension has often proved of great value. In the instance of a boy admitted some weeks after appendectomy because of occasional cramps and vomiting, it served to indicate the necessity for operation.

This boy had complained of pain after about twenty-four hours, but had only one fairly severe pain after admission to the hospital. After being observed over a period of several hours, auscultation at the height of that crampy pain revealed the presence of loud intestinal noises. Three hours later, when another plate was made of the abdomen, during which interval no pain had been complained of, and only occasional rumbles were heard with the stethoscope, it was observed that a marked progression in intestinal distension had obtained. This served as adequate indication for immediate operation. When the abdomen was opened several coils of small intestine were found adherent in a loop-like arrangement, and had formed a volvulus which in the course of a few hours would have progressed to a strangulation obstruction. A gas trap was formed, such that gas and fluid came in easily, but after awhile neither escaped, due to continued secretion in the incarcerated bowel which became more and more distended. The infrequency of the colics was undoubtedly due to the fact that the obstruction was only partial in character.

GENERAL CONDITION

Early in the course of simple obstruction the general condition of the patient is good. The crampy intermittent pain and nausea and vomiting make him ill at ease, but he may not appear especially sick. General abdominal distension is a late occurrence in acute intestinal obstruction and regurgitant vomiting, significant of a block in the bowel, occurs even more tardily. The vomiting which occurs early is of a reflex character, much as that observed in gallstone or kidney colic or in acute appendicitis. The body temperature is normal and continues so until late in the disease, when subnormal or, less often, elevations of slight degree may be recorded. There is ordinarily but slight quickening of the pulse and no change in blood pressure until prolonged continuance of the obstruction ushers in circulatory collapse as manifested by hurried feeble pulse, cold and livid extremities, pinched and sunken features, anxious expression and great restlessness. Late in the disease, the tongue is parched and great thirst is complained of; the urine is scant and of high specific gravity and may contain albumin and indican. Alterations in respiration are dependent largely upon the presence or absence of distension. Late in the course of intestinal obstruction rapid superficial respirations are the rule. The sensorium remains clear until near the end, when the sinister warnings of euphoria, delirium and coma portend the approach of impending death.

LABORATORY DATA

Leucocytosis is absent early. Later, incident to the dehydration brought about by vomiting, high leucocyte counts may be obtained with similar increases in the hemoglobin and red blood cells. It is to be emphasized that, though blood urea elevation, plasma chloride decrease and an alkalosis occur with regularity in high obstruction, they are not an early sign of acute bowel obstruction. In low obstructions, these changes are usually absent, and in high obstructions are observed only after about two days of vomiting.

SYMPTOMS OF STRANGULATION OBSTRUCTION

When in addition to a block in the continuity of the bowel, the intestine is deprived of its source of blood supply, a different clinical picture obtains than is observed in simple obstruction. Such a patient is more acutely ill; the pain is often agonizing in character; the pulse is usually quickened early in the course of the ailment and fever of 100° to 101° is not unusual and higher temperatures may be recorded. The breathing is superficial and more frequent than normal. When a long segment of intestine is involved in the strangulating mechanism, symptoms of collapse may occur due to loss of blood into the infarcted loop. Urinary suppression during the continuance of the strangulation is not uncommon.

The clinical picture is determined by the degree of arrest of blood flow to and from the strangulated segment. When this is marked, symptoms of strangulation predominate; when the deprivation of blood flow is less prominent, the symptoms of mechanical obstruction dominate the picture. Every gradation from mimicry of the picture of simple obstruction to profound shock may be manifest.

In strangulation obstruction local physical findings in the abdomen are almost invariably present. Consequent upon the infarction of the intestine, peritoneal irritation may usually be elicited by the demonstration of rebound tenderness. It must be conceded, however, that hemorrhagic infarction of the bowel or torsion of an ovarian cyst do not give rise to local physical findings in the abdomen as quickly as do intraperitoneal lesions of an inflammatory character. In the same manner, the degree of rigidity and tenderness are never as great. Occasionally and especially in volvulus the infarcted coil may become very prominent in the abdomen.

The demonstration of such a coil in strangulating types of obstruction has been described by

Wahl as "darmsteifung" or stiffening of the bowel. Contrary to general opinion, however, such an infarcted segment does not contain much gas, except in strangulations of a chronic nature such as some types of volvulus, in which the obstructive rather than strangulating features predominate. When a short segment of small intestine is concerned in the strangulation, this sign may be absent, due to the concealment of the involved intestine by other coils of bowel. Tenderness is usually present over the mass and the latter imparts to the palpating hand an elastic resistance. The coil is usually fixed and exhibits no peristalsis. The intestine above the obstruction distends gradually but it has been found in the experimental laboratory that the gaseous shadows in the small intestine do not appear as early in strangulation obstruction as in simple obstruction and that the roentgen-ray is, therefore, not as valuable in the early diagnosis.

Comparative studies have shown that the quantity of gas accumulating above the point of occlusion in simple obstruction is far in excess of that observed within the loop in closed or strangulated loops. Loud, peristaltic rushes may be heard from the contractions of the intestine proximal to the obstruction. The bowel below the obstruction being normal may evacuate feces and gas on the administration of an enema. Later in the course of the ailment an inhibition ileus, as may be seen in kidney colic or peritonitis, may supervene and the abdomen becomes relatively silent and enemas are not expelled.

Vomiting of a reflex nature sets in early after the onset of pain but ordinarily does not continue in the same degree as seen in simple obstruction. Blood in the stool is infrequent except in intussusception of children. Blood in the vomitus in high strangulations has now and then been observed. If the course of the disease continues uninterrupted, the beginning of the end of life is heralded for the sufferer by extreme restlessness, a feeble thready pulse, a cynanotic appearance of the skin which is cold and moist with sweat, and general signs of circulatory failure.

If the strangulated bowel becomes nonviable, peritonitis supervenes and hiccough frequently manifests this occurrence. It is to be remembered, however, that although the course of strangulation obstruction is ordinarily unusually rapid, owing to the deprivation of blood supply to a portion of the intestine, such is not the invariable occurrence. When the strangulating features are less prominent, the progress of the disease simulates the picture seen in mechanical obstruction at the same level, and it has not been an extremely rare observation to find a short infarcted loop as a consequence of thrombosis of the vessels in a segment of the mesentery go entirely unsuspected for more than a week's time, manifesting some abdominal discomfort, but not sufficient to warn the surgeon or patient of the lurking danger.

DIFFERENTIAL DIAGNOSIS

In surgical diseases of the abdomen of an acute nature, it has been my observation that many lesions are not recognized because the occurrence of a given lesion as a possibility in explaining the symptoms had not been given consideration. Acute pancreatitis, perinephritic abscess and early acute intestinal obstruction probably escape early diagnosis frequently because their occurrence had not been thought of or suggested. The recognition of acute lesions of the abdomen is essentially a clinical diagnosis. Whereas laboratory data and especially roentgenographic evidence are of inestimable value in the early detection of chronic diseases of the abdomen such as carcinoma of the stomach, cholecystitis, renal stone and carcinoma of the colon not causing bowel obstruction, in acute surgical lesions of the abdomen laboratory data are of subsidiary importance. In the determination of whether free gas is present in the peritoneal cavity in a suspected perforation of a hollow viscus and in the visualization of gaseous shadows in the small intestine in acute intestinal stasis, the roentgenogram exhibits its greatest worth.

The diagnosis of most acute lesions of the abdomen is made on indirect evidence. "Abdomen" means hidden and a knowledge of the train of symptoms accompanying a given acute disaster and the proper evaluation of the physical signs present are the agents of greatest import in permitting one to identify with a high degree of accuracy the various disorders of an acute nature affecting the abdominal viscera. The ultimate opinion in any case must be based on sound clinical judgment. In arriving at a diagnosis the history must be gone into with extreme care and the physical examination must not be perfunctory. Experience is a significant item in the correct interpretation of any abdominal lesion of an acute nature, but it cannot be too strongly emphasized that clinical judgment is not all art. Science and method are equally as necessary in arriving at a worth-while opinion as they are in obtaining the desired result in a delicate laboratory experiment.

Space does not permit of discussing the differentiation of cases of bowel obstruction from other acute lesions of the abdomen in the length that the importance of the matter justifies, nor can any attempt be made here to discuss the recognition of the various types of intestinal obstruction. The most distinguishing feature of simple obstruction is the absence of local physical findings. Any intermittent colicky pain attended by nausea and vomiting but not associated with abdominal tenderness nor rigidity should immediately suggest bowel obstruction. When the causative agent of obstruction is an adhesive band that has acquired attachment to the abdominal parietes, tenderness may be complained of at that point. There is no interference with the diaphragmatic component of respiration in simple obstruction to the continuity of the bowel, whereas in the strangulating varieties of obstruction incident to the abdominal tenderness and splinting of the abdominal muscles as may occur, limitation of excursion of the diaphragm is occasionally noted. It may be repeated here that, though tenderness and rigidity are almost always observed in strangulation types of obstruction, these physical signs are not nearly as prominent as in inflammatory lesions of the abdomen.

Briefly, it may be stated that cases of simple obstruction are most closely simulated by colics that are unattended by physical findings. Strangulation obstructions must be differentiated from every abdominal colic that produces tenderness and rigidity of the abdominal wall.

SIMPLE OBSTRUCTION

The number of conditions that need to be considered in differentiating early simple intestinal obstruction is, therefore, rather small. All the colics of the abdomen except those of the bowel are soon followed by local tenderness over the seat of the lesion. Every intraperitoneal organ, however, that may cause colic and that develops embryologically as a diverticulum of the gut may give rise to midline pain. Extraabdominal lesions, such as syphilitic involvement of the posterior horns of the spinal cord and dorsal ganglia, as occurs in tabes accompanied by gastric crises, spinal cord tumors, arthritis and tuberculosis of the spine and other lesions that produce a segmental disturbance in innervation, may occasionally give rise to confusion with simple bowel obstruction. These lesions are not uncommonly associated with rigidity of the abdominal muscles but tenderness is invariably absent. In gastric crises the pain may be colicky but the other neurologic findings serve to identify the disease. In the other lesions enumerated, the pain is usually more continuous in character, and nausea and vomiting are not prominent features. It has been my observation that the colics of the bowel are not usually as long sustained as those that occur in the hollow tubes of bile duct and ureter. The pain of intestinal colic quickly reaches its acme and falls rather abruptly, being sustained for only two or three minutes, then recurs again after a free interval. The duration of the painful seizures attending gallbladder or kidney distress is much longer sustained, approaching a plateau type of curve.

The lesion that early simple intestinal obstruction is probably most often mistaken for is the "simple belly-ache," under which category one might list food indiscretions of one sort or another, abdominal allergic reactions and acute enterocolitis. In these, however, diarrhea is usually a prominent symptom and vomiting is very much less in the foreground than in obstruction. Even though the early vomiting of intestinal obstruction is reflex in character just as it is in gallstone or kidney colic, the vomiting of obstruction is more frequent, urgent and copious than in other types of reflex vomiting. When gaseous distension occurs in "belly-ache," it involves almost invariably the entire intestine, whereas most mechanical obstructions of the small intestine (except carcinoma of the left colon) cause only gaseous distension of a portion of the small intestine (the bowel above the occlusion). Progression of intestinal distension, as observed in obstruction to the continuity of the bowel, likewise does not occur in enterocolitis.

The absence of local physical findings and the presence of loud gurgling intestinal noises at the height of the colic account adequately for the mimicry of bowel obstruction by these colics. The high pitched tinkling sounds, as are heard in the presence of a dilated obstructed bowel under tension, rarely occur in enterocolitis and its related types of intestinal pain. The value of repeated examinations at short intervals should not be forgotten. A patient suspected of having bowel obstruction should be under hourly scrutiny and preferably in a hospital.

It must not be forgotten that some varieties of simple obstruction may partake also of features of strangulation obstruction. Adhesion by bands is the best example. A band or cord beneath which coils of the bowel have insinuated themselves may at first only compress the bowel, later strangulate it.

STRANGULATION OBSTRUCTION

As has previously been pointed out, strangulation obstructions present a block in the bowel with the addition of infarction of the imprisoned segment of bowel. Venous obstruction of the circulation permits of a more rapid accumulation of blood within the lumen of the bowel as well as within its wall, and consequently signs of peritoneal irritation develop more rapidly than when the arterial inflow as well as the venous egress of blood is occluded. The lesser grades of venous block, however, may be somewhat tardy in giving rise to peritoneal irritation and, as has already been stated, either the symptoms of obstruction to the continuity of the bowel or the strangulating features may dominate the picture, contingent upon how much the circulation is interfered with.

When the signs of bowel occlusion predominate, the sequence of intermittent colic, at the height of which loud intestinal borborygmi may be heard, serves to distinguish the condition. Even in fear of reiteration to the point of being wearisome, I repeat, other abdominal colics do not give rise to increased peristaltic activity of the intestine. In strangulation obstructions, accompanied by tenderness and slight rigidity, this occurrence is of extreme importance in diagnosis.

A large number of conditions must necessarily be thought of in the differential diagnosis of strangulating obstructions, including all the abdominal colics such as gallbladder and renal seizures; the inflammatory conditions such as appendicitis, salpingitis, peritonitis and kidney infections; pancreatic necrosis and diaphragmatic pleurisy; purpura and other skin lesions with hemorrhage in the bowel wall, as well as the torsion of other organs, especially ovarian cysts and the testis.

An ovarian cyst twisted on its pedicle may closely imitate a strangulation obstruction in its clinical features. The stethoscope serves to differentiate the early case. The late case of ovarian cyst torsion has usually ceased to vomit. The strangulating features of tenderness and other signs of peritoneal irritation are there, as well as fever, leucocytosis and a quickened pulse, but the obstructive feature (vomiting) is usually less prominent or absent, even though intestinal distension may be present.

The general condition of the late case of torsion of an ovarian pedicle is also much better than that presented by cases in which the bowel is strangulated. However, no great significance should be attached to seeming improvement. How many cases die of it! In both instances a mass may be felt; in the instance of torsion of an ovarian cyst the mass is usually pelvic but in the presence of a long pedicle it may arise in the abdomen. In the late case of torsion of an ovarian cyst, borborygmi may be heard with the stethoscope incident to a low grade of mechanical obstruction afforded by the presence of the mass. Crampy, intermittent gas pains are usually not complained of, when an ovarian cyst has undergone torsion of the pedicle. The audition of loud intestinal noises coincident with pain establishes the colic as intestinal in nature.

The very presence of local physical findings will indicate on casual examination the probable presence of a surgical lesion, which warning signal unfortunately the early case of simple obstruction does not present. Many of the conditions that have to be differentiated present gaseous distension of the bowel on roentgenologic visualization, but usually it concerns the entire bowel. It must be admitted, however, that there are instances among the causes of reflex ileus accompanying the conditions enumerated, in which localized gas accumulation may only concern part of the bowel. However, the progression of distension is different. Even in the atypical instances of cases mentioned above there is a tendency to rather rapid and uniform, even though not great gaseous distension of the entire bowel. As has been mentioned previously, however, the strangulated segment contains relatively little gas and instances have come to my attention, in which we have been able to make preoperatively, from viewing the roentgenographic film, the diagnosis of strangulation obstruction by the interruption of continuity in the "ladder pattern" of the distended coils (figs. 6 a and 6 b).

Employing the criteria outlined above, it is my firm conviction that most cases of bowel obstruction of both the simple and the strangulating variety can be detected early. If the functional neurogenic ileus, displaying spastic features referred to above under the section of roentgenographic diagnosis, be properly identified, no great anxiety need be had lest cases be operated upon that do not exhibit obstruction of the bowel, when operation is advised in the absence of general distension and absolute obstipation. Though I have not as yet experienced such an embarrassment, I am prepared to meet it

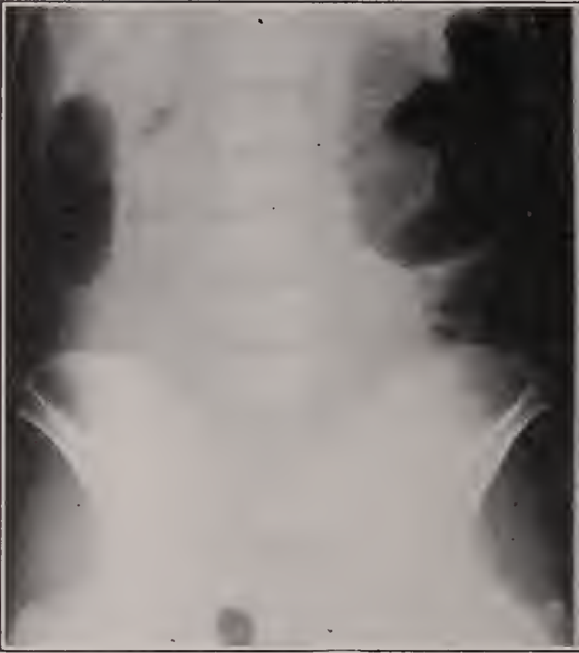

Fig. 6 a.

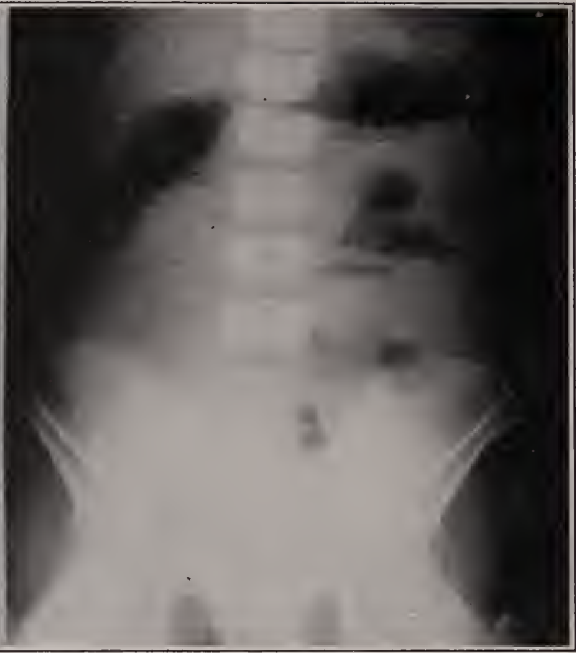

Fig. 6 b.

Fig. 6 a. Radiograph of abdomen of a child with gangrenous loop eighteen inches in length in the mid-abdomen. Gaseous shadows are visible in the left and right upper quadrants of the abdomen. No visible gas in the small intestine, where the gangrenous bowel was found at operation. Coincident with the occurrence of gas pains, loud borborygmi were heard on auscultation. The abdominal tenderness, the roentgen-ray film and the presence of intestinal colic serve to identify this as a type of strangulation obstruction.

Fig. 6 b. A Mikulicz exteriorization of the gangrenous bowel was done. Subsequently the bowel was anastomosed by end to end suture. Since dismissal from the hospital the patient was readmitted and successfully operated upon for another strangulation obstruction.

and will not feel particularly chagrined, supported by the belief that an unnecessary exploration which is not accompanied by operative risk and which wipes out the dilemma of the existence of a potential serious lesion is the lesser evil.

Of no other disease is J. B. Murphy's statement that "procrastination kills more patients than cancer" more axiomatic than in acute intestinal obstruction. It is the physician who makes the diagnosis early in bowel obstruction who saves most lives. Well executed operations late in obstruction have only disappointing results to both patient and surgeon. Timely operations are easily performed and may boast of almost uniformly good results. No campaign need be carried on with the laity to acquaint them with the seriousness of the problem. Their complaint in most instances brings them to the physician adequately early. It is upon ourselves, as a profession, that we must focus our attention and efforts at education in order that bowel obstruction may be early recognized.

TREATMENT

With the exception of those cases of bowel obstruction that have their genesis in a neuromuscular imbalance, the treatment of all others is early surgery. The reduction of early ileocecal and pure colonic types of intussusception in children with enemas under the influence of gravity pressure (three feet) is often successful and has been described elsewhere. When it fails, recourse should be had to immediate operation. Even in spastic and inhibitive (paralytic†) ileus, resort must be had occasionally to operation. Instances of so-called spastic ileus are reported, where patients have died because at operation no indication was felt to exist for establishing decompression of the distended bowel above the contracted area by enterostomy. Inhibitive ileus not due to peritonitis responds in most instances to drug therapy and, as the agent responsible for the intestinal distension becomes less effective, spontaneous improvement occurs. Pituitrin, Noble's enemas, eserin and hypertonic saline (75-100 cc. of a 15 per cent salt solution) and various combinations of these therapeutic agents prove effectual in most instances. When they fail, spinal anesthesia should be employed and often succeeds. If it is without result, enterostomy is occasionally indicated. In the inhibitive ileus due to peritonitis, however, the prognosis is poor and depends entirely on the virulence of the infection.

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† Paralytic ileus is a poor term, for the bowel wall is not paralyzed in the diffuse intestinal distension of peritonitis. Its peristaltic activity is inhibited by overactive sympathetic nervous stimuli. When these are released by spinal anesthesia, the vagus nerve, the motor nerve of the bowel, is empowered to act and temporary evacuations are often obtained.

Only when the infection itself in the peritoneum holds no serious threat to life is the outlook at all favorable.

It is my belief that in the presence of peritonitis, unless plastic masses are present which produce compression or kinking of the bowel, remedial measures should be limited to conservative non-operative methods. I have seen no good come from enterostomy or cecostomy in peritonitis and it is my firm belief that incision of the abdominal wall with the most gentle minimal manipulation of the bowel incident to establishing intestinal drainage will contribute more to dissipation of the intraperitoneal infection and consequent augmentation of the intestinal distension than can possibly occur with the most vigorous attempts at stimulating peristaltic activity with drugs. When the danger of infection is safely past, and ileus still continues, enterostomy may be of value.

No attempt can be made here to elaborate the special treatment of any of the types of obstruction. In the following the more significant principles concerned will be briefly discussed.

WHEN TO OPERATE

The essence of the treatment of acute bowel obstruction is early diagnosis and early surgical intervention. Operation must not be deferred until the nature and location of the obstruction are known. This information can be more accurately determined at operation with less risk to the patient than if surgical interference is put off until all these queries can be satisfactorily answered. When it is appreciated that it is most important to recognize bowel obstruction early, a large number of operations will be in the nature of an exploratory procedure as to the type of lesion that will have to be dealt with. Unfortunately, at the present time a large proportion of the operations performed for the relief of bowel obstruction are in the nature of resuscitations, and failures and bitter disappointments are numerous. The two problems that afford the greatest concern in dealing with bowel obstruction are recognition of the early case and treatment of the late case. To recognize the late case is only a layman's task. To be privileged to treat cases of intestinal obstruction early in their course is every surgeon's hope.

PREOPERATIVE PREPARATION

When the decision to operate has been made, no great time should be lost in preoperative preparation. During the hour that preparations are being made in the operating room, the patient's stomach should be evacuated with a tube and one to three liters of 5 per cent glucose in normal saline given intravenously and subcutaneously. There is a widespread impression that it is more important to put off operation for eight to ten hours, during which time the patient's condition is being "built-up" with free administration of glucose and saline. Though salt and water are important agents in combating the dehydration of obstruction, it must be remembered, as has already been pointed out above, that only in high obstructions do these therapeutic agents exhibit the virtues of a specific. The difficulty of determining the location of the obstruction or its exact type with certainty before operation precludes deferring operation in the hope that saline alone will prove an effective remedy and improve the patient as a preoperative risk. Only in so-called arteriomesenteric ileus and the temporary mechanical obstructions that occur at the stoma following gastroenterostomy or the Polya type of gastric resection is one justified in temporizing with saline. In this latter type of obstruction saline as a specific exhibits its greatest field of usefulness. There are a few cases of incomplete low obstructions, in which dehydration incident to continued vomiting has gotten the patient into a rather precarious condition, in which a few hours (4-6) preoperative preparation with fluids will better fortify him to stand the ordeal of operation. Only, however, when the roentgenographic film indicates that the degree of intestinal distension is not great, is this temporization justified.

The usual preoperative dose of morphine (1/6-1/4 grain; 10 to 15 mg.) should be given. The commonly expressed opinion that morphine paralyzes the bowel or interferes with the motility is erroneous. On the contrary, morphine enhances the intestinal tone as well as peristaltic activity of both the normal and the obstructed intestine. The constipating effect of morphine as observed in addicts is due to its stimulating effect on the sphincters of the bowel.

SELECTION OF ANESTHETIC

When patients come to operation early, the choice of an anesthetic is not so important. But to administer inhalation anesthesia to a patient with regurgitant vomiting and considerable distension, even though the stomach is emptied by a tube immediately before the administration of the anesthetic, is a hazardous undertaking.

Spinal anesthesia is the ideal analgesic agent for cases of intestinal obstruction. At the University Hospital we have employed it with complete satisfaction to the exclusion of all other types of anesthetics in intestinal obstruction except in newborns, in whom local infiltration of the abdominal wall with procaine, combined occasionally with light ether anesthesia, usually suffices. Spinal anesthesia is also the agent of choice in children with bowel obstruction and we have used it with satisfaction in the reduction of an intussusception in a child of nine months. We have employed Pitkin's spinocaine largely and, with the maneuver suggested by Schwyzer[15] of placing the patient on his abdomen for a few moments with the shoulders slightly elevated, adequate anesthesia with relatively small doses may be obtained and the level of the anesthesia can be fairly well controlled. No harm is to be anticipated in administering spinal anesthesia because of the induced increased intestinal activity in the presence of a mechanical obstruction, when immediate operation is to be performed. The early history of the employment of spinal anesthesia is a dark chapter, but recognition of the fact that the Trendelenburg position and not the upright posture protects the patient, and the employment of ephedrine to support the blood pressure have made its use safe. With the employment of spinal anesthesia, many late cases that would not have tolerated operation under inhalation anesthesia have been successfully operated upon.

CONDUCT OF OPERATION

Before operation is undertaken, everything necessary for the safe and expeditious conduct of the procedure should be in readiness. Needles should be threaded with fine sutures that are immediately available. All details of the operations are to be arranged beforehand. The patient must be kept warm and loss of body heat guarded against during the operation. With the employment of spinal anesthesia, the time element required in the performance of the operation perhaps is not so all important as previously, but in the ledger of failures and successes it is still a most significant item in the treatment of the late cases.

INCISION

Unless it is definitely known just where the obstruction is, it is best to make a midline subumbilical incision, or a midright rectus opening of the peritoneal cavity. When operating upon children, it must not be forgotten that the bladder is an intraabdominal viscus, and the incision should consequently be placed higher on either side of the umbilicus. It is always a good plan to have the urinary bladder empty before the patient is placed on the operating table. Most instances of small bowel obstruction can be approached satisfactorily through such an opening. In the presence of a large bowel malignancy, in which a colostomy is found to be the procedure indicated, a short oblique inguinal incision can be made in either groin and the establishment of the colon decompression facilitated through the midline incision. In instances of simple obstruction occurring postoperatively a short oblique incision over the rectus muscle, pulling the latter medially, is best made.

LOCATION OF OBSTRUCTION

In locating the point of obstruction, it is always wisest to hold up the abdominal wall first with retractors and look inside. The employment of spinal anesthesia permits easy and wide retraction of the abdominal walls and frequently exposes the site of obstruction, especially if the intestine is adherent to the parietal peritoneum. In disregarding this simplest of procedures the obstruction may not be located after diligent search with the hand in the abdomen. Short of a routine "going over" of the entire intestine, it is the most efficient method by which to locate the obstruction.

Many years ago Greig-Smith pointed out that a distended coil in the proximity of the site of occlusion will usually present itself into the wound. If the point of obstruction does not immediately come into direct vision, pursuit of the coil in the direction that presents itself least readily will usually lead to the obstruction. In addition, the intestine immediately above the point of obstruction will be hyperemic as well as dilated. When cases of intestinal obstruction are operated upon earlier, exploratory examination can be more deliberate and these signs are not as important. At least some of these cases, however, will always be with us and we must be prepared to treat them most efficiently.

CHOICE OF PROCEDURE

The most important decision the surgeon has to make when operating for intestinal obstruction is whether it will be possible to do the operation of election, viz., to find and relieve the obstruction and restore the continuity of the bowel or whether he must content himself with a simple drainage

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[15] Schyzer, Arnold: Spinal Anesthesia with Reduced Dosage of Spinocain. Minn. Med., 13:855-859. Dec., 1930.

operation. The nature of the obstruction will in part decide this matter. In a strangulation type of obstruction, in which a segment is deprived of its blood supply, it is apparent that choice of the magnitude of operation that the patient can best tolerate must not determine the procedure to be followed. Relief of the mechanical block in the bowel by enterostomy or release of the strangulating mechanism alone will not suffice; excision or exteriorization of the devitalized bowel must also be done. The continuance of such a segment in the abdomen is not compatible with recovery. The performance of a simple drainage operation in the presence of strangulation obstruction advanced to the degree of loss of vitality is, therefore, futile.

Immediate determination as to type of obstruction present must, therefore, be decided. The occurrence of bloody fluid in the peritoneal cavity signals the presence of a strangulation obstruction. Hemorrhagic fluid is seen occasionally though rarely in late simple obstruction. Its presence, however, demands exact determination of the type of obstruction. An infarcted coil of intestine lends confirmation of the presence of a strangulation obstruction.

The course of action must depend solely on whether or not the bowel is viable. The return of normal color to the bowel and the return of pulsation in the vessels of the mesentery after reduction of the strangulation herald the viability of the bowel. In doubtful cases the decision as to what is best to do may be a difficult one. When the condition of the patient permits, a resection with end-to-end or lateral anastomosis is the operation of election; damaged bowel proximal to the strangulation must be excised generously. It is a hazardous procedure, however, to perform an anastomosis on a distended hemorrhagic bowel. In ill patients it is much the wiser plan to exteriorize the gangrenous bowel even in the small intestine and perform a secondary anastomosis later. If the fistula following exteriorization proves to be high in the small intestine, the content from the upper loop should be collected with a catheter and put into the distal segment. The bowel wall of the strangulated segment may be edematous, but there should be no sharp line of demarcation of color between the normal and the involved intestine. When edema persists, the normal luster and sheen of the peritoneal surface of the bowel may not return promptly. Normal contractile response to pinching is absent in the nonviable bowel.

When a strangulation obstruction is not present, the surgeon in his selection of operative procedure should permit himself to be guided entirely by the patient's condition. In the early case the operation of election may be performed, viz., the determination of the location of the obstruction and its release. In the precarious risk the absence of a strangulation obstruction is indication for the performance of decompression by enterostomy. The determination of the location and exact nature of the obstruction in such cases is made at the risk of inviting disaster. Suppression of curiosity on the part of the surgeon at such a time will afford him an opportunity to determine later in a living patient what need be done. Such a patient should be managed in the manner in which one treats a drowning man. An attempt should be made first to save his life; later he can be taught to swim. It should be remembered that, though the persistent existence of adhesive bands in the small intestine are potential forerunners of subsequent intestinal obstruction, such a patient may find himself so free from symptoms as to be unwilling later to submit to more surgery.

In early cases of simple obstruction, location of the point of obstruction and evisceration of the intestine in its search may be practised with safety and equanimity. Evacuation of the intestinal content by enterostomy in such cases may be dispensed with as unnecessary. All anastomotic procedures on the dilated intestine are to be religiously avoided. Tissues partially devascularized by long continued compression of the blood vessels of the bowel wall, consequent upon the intestinal distension, do not permit safe suture.

In postoperative obstructions enterostomy as a single therapeutic agent serves its widest field of usefulness. Consequent upon the subsidence of intestinal distension brought about by enterostomy, the continuity of the intestine is usually automatically reestablished and the enterostomy opening closes spontaneously, when the safety vent has served its purpose upon withdrawal of the tube.

The statistical mortality in this group of cases is surprisingly high. The late recognition of the cases is in large part responsible for this high death rate, but the tendency to performance of operations of election rather than the adaptation of a procedure suitable to the precarious condition of the patient contributes in no small degree to the persistence of a forbidding mortality in this group. Evisceration of the intestine to locate the site of the obstruction, or the manual manipulation and examination of long segments within the abdomen, and prolonged operative procedure incident to their performance rob the ill patient with late simple obstruction of a large margin of his chance for recovery.

SELECTION OF SITE FOR ENTEROSTOMY

A distended coil of intestine above but near the point of obstruction should be chosen as the site of enterostomy. The deliberate performance of a jejunostomy in each case is not only unnecessary but harmful. The exponents (Bonney[16]) of high drainage of the intestine in obstruction have insisted that the tapping of the fluid and gas containing segment is all-important. In addition, it was erroneously contended that such a vent permits escape of the most toxic intestinal content. The danger of a high intestinal fistula, per se, has been adequately demonstrated. Haden and Orr[17] have been able to show that in the dog even partial escape of the jejunal content through catheter drainage always proves fatal. High jejunostomy, therefore, unless inevitable because of the location of the obstruction, is to be deliberately avoided.

TECHNIC OF ENTEROSTOMY

In the performance of enterostomy fine needles and suture material, preferably silk or 000 chromic catgut are to be employed. When conditions permit, it is a good plan to draw out the loop upon which enterostomy is to be done and isolate it between two rubber covered clamps. The content of the loop can be milked out between the fingers before applying the clamps. When, however, the bowel is enormously distended and difficult of delivery, puncture of the bowel wall with a fine needle, followed by withdrawal of the content of the loop with an aspirating syringe, will obviate the occurrence of leakage from the stitch holes. An urethral catheter (No. 16 French) is then buried in the bowel wall by the Witzel technic. It is a good plan to lay the catheter on the bowel and establish an oblique tunnel by a short continuous or a few interrupted sutures before the bowel is punctured. It is highly essential in introducing the catheter into the bowel that there be no spillage. Whereas ordinarily the opening and suture of the small intestine can be done without great concern of slight contamination, under the influence of obstruction bacteria multiply rapidly in the bowel, such that the slightest spillage enhances very greatly the peril of peritonitis.

Emptying of the content of the loop before placement of the sutures diminishes markedly the danger of contamination. It is my practice to puncture the bowel with a Bard-Parker blade No. 11 (any knife with a pointed blade will do). The surgeon and his assistant make tense the site of puncture by slight traction with tissue forceps. The catheter is then pushed through this tiny opening into the bowel and the enfolding stitch completes the oblique peritoneal tunnel. When possible the proximal end of the catheter should be drawn through the omentum and the latter should be fixed to the anterior abdominal wall. Often, however, in operations performed for postoperative obstructions, no omentum is available because of retraction toward the operative site. I never hesitate to drop the loop of bowel, upon which the enterostomy has been made, back into the free peritoneal cavity. With the employment of a small catheter and a long peritoneal tunnel, spontaneous closure of the fistula will occur.

Not infrequently patients who survive obstruction die from the loss of fluid, when the enterostomy is improperly done and a large tube is used. A number 16 urethral catheter will drain the bowel just as efficiently as a large hose. A few patients are seen each year at the University Hospital who have survived enterostomy for the relief of obstruction but who come for the closure of the intestinal fistula. Angulation of the bowel at the site of enterostomy by the multiple purse-string suture method and the employment of too large a catheter are largely responsible for such occurrences. A third factor, viz., the persistence of obstruction in the bowel distal to the drainage vent, is occasionally at fault, but the technical errors referred to are the common cause of persistent fistula.

I make it a practice to score the catheter before it is buried in the bowel wall. By placing the catheter on the stretch and making a superficial circular cut around it, about four or five inches from the eye, a groove is secured, in which a fixation suture may be placed. When the traction on the catheter is released, the groove and knot in the suture are scarcely apparent. A fine chromic catgut suture is best employed to secure the catheter to the bowel wall. This refinement precludes the catheter coming away before it has wholly fulfilled its intended purpose. The catheter comes away by itself usually by the tenth or twelfth day, but it can easily be retained longer by fixing it over the skin with adhesive tape.

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[16] Bonney, Victor: Fecal and Intestinal Vomiting and Jejunostomy. Brit. Med. Journ., 1:583. April 22, 1916.

[17] Haden, R. L., and Orr, T. G.: Chemical Changes in Blood of Man after Acute Intestinal Obstruction. S., G. and O., 37:465-468. Oct., 1923.

I do not believe that the employment of the Moynihan evacuation tube has any advantage; it exposes the intestine to unnecessary trauma and precious moments are wasted. When the distension is extreme, immediate evacuation of the bowel on the operating table by a trocar before suturing the catheter in place is commendable. However, I have not found it necessary to do this with the employment of spinal anesthesia. After the placement of the catheter in instances in which the distension is great, I permit the bowel to decompress itself as the abdomen is being closed, by removing the clamp on the distal end of the catheter, collecting the content in a basin at a safe distance from the site of operation. The excellent results that Holden has obtained by his method of milking out the bowel at the time of operation are probably to be attributed more to the early diagnosis that he has emphasized than as a commendation of the method that he has employed in emptying the intestine.

POSTOPERATIVE TREATMENT

After operation the patient should be placed in bed so that respiration is unhampered. Semi-Fowler's position usually gives most comfort. Physiologic sodium chloride solution is to be given daily subcutaneously with daily intravenous glucose (10 per cent) administration until the patient takes fluid well by mouth. The intake and output are to be carefully recorded; the vomitus or gastric retention recovered by expression are to be subtracted from the fluid intake. An optimum intake for a patient with intestinal obstruction, in whom a considerable amount of fluid is abstracted from the tissues and continuously dumped into the intestine, is in excess of the requirements of the ordinary abdominal surgical patient. In intestinal obstruction, only when salt begins to be excreted by the kidney does a diuresis occur. Three to four thousand cubic centimeters of fluid may well be utilized for the first few days. When a liberal output of urine occurs, the intake of fluid may be decreased.

The patient with an enterostomy high in the intestine must be carefully watched for evidence of ill consequences from the loss of the high intestinal juices. When the effects of the obstruction have been successfully combated, the catheter may be intermittently clamped to determine the patency of the intestinal channel below. In the event that the enterostomy presents the only avenue of escape for the intestinal secretions, another catheter must be placed in the distal bowel, into which the fluid collected from the oral loop may be placed, or a more direct attack on the obstructing mechanism must be made. The optimum time for such a procedure is when the patient exhibits the greatest improvement from the intestinal decompression.

SUMMARY AND CONCLUSIONS

The present high mortality in acute intestinal obstruction is due in large measure to late diagnosis. The absence of local abdominal physical findings in simple obstruction; misinterpretation of the significance of the expulsion of gas with enemas; indiscriminate administration of morphine before making a diagnosis; and the equivocal and oftentimes deceptive information obtained with apparently effectual catharsis in partial obstructions are factors that contribute to delay in diagnosis.

Intermittent colicky pain, associated with nausea and vomiting but unattended by abdominal tenderness or rigidity, suggests a block in the continuity of the bowel. In strangulation types of obstruction local physical findings are usually present, though not as early as in peritoneal lesions of an inflammatory character. The bowel below the point of obstruction is physiologically as well as anatomically normal and will expel an administered enema with the return of gas and feces. Gaseous shadows in the small intestine, visualized by roentgenographic examination, demonstrates the presence of intestinal stasis. The stethoscope serves to distinguish whether the stasis is mechanical or paralytic in character.

Our textbook descriptions of intestinal obstruction should be labelled, "Antemortem Signs of the Disease." They do not indicate interference with the continuity of the intestinal lumen but herald impending dissolution. Regurgitant vomiting and distension must cease to be criteria awaited before a diagnosis can be made. Blood chemistry alterations obtain regularly only in high intestinal obstructions and are a late occurrence. Collapse in simple bowel obstruction should be relegated to the delineation of that antemortem status, in which all vital functions rapidly depreciate and from which escape or resuscitation is unlikely. In strangulation obstruction collapse is synonymous with torsion of a relatively small segment, into which considerable blood is lost.

When the criteria upon which the diagnosis can be made early are properly evaluated and patients with acute intestinal obstruction come to operation at an opportune hour, the appalling mortality of the disease will cease to exist.

SYMPATHETIC ALCOHOLIC INJECTION FOR RELIEF OF ARTERIOSCLEROTIC PAIN AND GANGRENE*

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Among the most distressing degenerative lesions encountered in late adult life is the painful obliterating arteriosclerotic endarteritis of the lower limbs. Pain in this disease may vary in degree of severity from intermittent claudication to the intense pain associated with trophic disturbances and gangrene.

Various forms of treatment have been applied unsuccessfully; almost invariably amputation becomes a necessity. Unfortunately, however, pain frequently persists after amputation.

Perivascular sympathectomy (LeRiche) has, heretofore, been our most effective method of treatment. I have performed a number of these operations on patients having severe pain and even gangrene. Although this procedure occasionally gives startling effects in the relief of pain and in the improvement of the trophic conditions, these results are difficult of explanation in the light of our present knowledge of the anatomy and physiology of the sympathetics. The operative outcome is uncertain. For example, when success might be anticipated, no relief whatsoever is obtained, whereas in a seemingly hopeless case pain may be entirely relieved and marked improvement in circulation ensue.

LeRiche has reported excellent results, but no one has been quite able to duplicate them. However, his reports led to many operations for a variety of conditions; the results of these operations are instructive, though usually inconclusive. The individual operator's enthusiasm was gauged by the initial results of his first few cases, in that, if the desired effect was produced, he became an enthusiast; if not, he abandoned the technic as a worthless procedure. It is true, however, that in some cases the LeRiche operation has been very successful.

Until recently, if the perivascular sympathectomy was unsuccessful, there was little further to offer, and amputation was frequently necessary. About a year ago I began the injection of sympathetic trunks and ganglia as a diagnostic procedure; later, because of White's reports, I adopted the therapeutic injection of alcohol with increasingly satisfactory results.

My first case to record the above treatment occurred last fall, when I saw a man, seventy-three years of age, having intense pain in his right leg from the knee to the foot. This pain was aggravated by motion, persisted while at rest, becoming intense at night. While doing a LeRiche operation, the referring surgeon had ruptured the femoral artery and was forced to ligate.

When I first saw the man his limb was cold, the pain still present. I suggested injection of the lumbar sympathetics with procaine to see if the pain might be diminished. And accordingly, when I injected his first to fourth lumbar segments with procaine, the pain disappeared within a few minutes. I next injected 5 cc. of 95 per cent alcohol in each needle.

The pain was now completely relieved and the temperature increased for forty-eight hours, at which time the pain recurred. Feeling that this was due to faulty injection rather than failure of the method itself, I placed needles at the twelfth dorsal, first, second and third lumbar segments. This time I did not inject procaine, thus avoiding diluting the alcohol, 5 cc. of which were again injected in each needle. The pain was entirely relieved and has not returned to date. On the other hand, he developed a most distressing alcoholic neuritis, which will be referred to later. Because skin temperature was not measured before injection, I was unable to determine the degree of increase, but the foot was markedly warmer than it had been previous to the injection.

This led to the application of the procedure in other cases. At the date of writing, eight patients have been treated in like manner. In three of these the condition was bilateral, in the others unilateral. Seven out of the eight, including the three in which bilateral injections were done, have been completely relieved. There has been but one failure, an obese man, sixty-seven years of age, whose pain was present only at night, and never brought on by exertion. Thus the diagnostic injection gave no information, since he was experiencing no pain at that time. Although alcoholic injection produced a marked increase of temperature in his limb, it had no effect on the pain and, therefore, I conclude that this pain was not of a vascular origin.

If one follows the method, which I shall describe, it should not be difficult to select suitable cases, and the majority should show good results. It is probable that some of these are cases of Buerger's disease rather than arteriosclerosis, for it is very difficult to differentiate the two conditions in men over forty-five years of age. Even the roentgenographic findings are not conclusive.

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* From the Neurosurgical Clinic.

* Read before the Forty-second Annual Meeting of Washington State Medical Society, Aberdeen, Wash., Aug. 3-5, 1931.

Diagnostic injection is the mode to be employed. For twenty-four or forty-eight hours preceding the injection neither narcotics nor sedatives should be given. The skin temperature should be accurately measured after exposing the limbs for at least one-half hour before the injection, which should be done in a cool room, the room temperature being noted. I employ a Tycos dermatherm for temperature readings because it is rapid and at the same time accurate. One can use a special mercury thermometer, or even an ordinary one, although these are inaccurate and the readings time consuming.

The needles should be inserted at the levels of the first, second, third, and fourth lumbar segments. Wheals are made two fingers' breadth from the midline, opposite the first four lumbar interspaces. The needles are then inserted directly perpendicular to the plane of the back until the transverse processes are encountered. The depth should then be measured, the direction of the needle changed so as to slip just below the edge of the transverse process, lateral to the body of the vertebra, and then inserted two fingers' breadth deeper. This will bring the point into close approximation to the sympathetic trunk and ganglia. From 2 to 5 cc. of 1 per cent procaine are then injected in each needle. If the needles are properly inserted, temperature increase and improved color of the toes will be apparent in from five to fifteen minutes.

The pain usually disappears before vascular changes become apparent. It is not necessary to await these changes, if the pain disappears; at the same time, it is best to delay ten or fifteen minutes before injecting alcohol in order to minimize dilution. Before injecting the alcohol the patient is anesthetized with gas, because alcoholic injection, even when preceded by procaine, is very painful. Five cubic centimeters of 95 per cent alcohol are then inserted in each needle and the needles withdrawn. The same method is followed in the dorsal region, except that the wheals and insertions are made opposite the spinous processes instead of opposite the interspaces. This technic was obtained from Dr. J. S. Lundy. It is accurate and gives a uniform technic for sympathetic injection at any level, having been found safer, more accurate, and easier than that described by White.

If vascular changes occur following the injection, showing that the sympathetics have been interrupted but the pain persists, it is not of sympathetic origin; it would be useless to inject alcohol unless trophic changes are present. If the pain is relieved, even though vascular changes do not occur, alcohol should be injected and will probably result in relief. The blood vessels may be too incompetent to allow for an increased blood supply, but the pain may be relieved nevertheless.

CASE REPORTS

Case 1. D. R., male, age 73. Chief complaint. Pain in right leg from knee to ankle. Onset about two months before admission. Pain aggravated by walking, present at rest, prevented sleep at night.

Feb. 15, 1931. LeRiche operation elsewhere, with ligation of femoral artery, pain persisting.

Feb. 18. Diagnostic procaine injection of lumbar first, second, third and fourth. Relief of pain; marked increase of temperature for two days, then recurrence of pain.

Feb. 21. Alcohol injected at dorsal twelfth, lumbar first, second and third without preliminary procaine injection.

Result. Complete relief of pain and marked increase of temperature to date. Intense alcoholic neuritis and anesthesia persisting about five weeks.

Case 2. H. E., male, age 53. Chief complaint. Pain and coldness of both legs. Left tibia and fibula fractured Jan. 15, 1931. Poor union; leg in cast for five months.

Feb. 15. Pain in left heel and above ankle when foot was dependent. Both feet blue and cold when dependent; obtained relief by elevation. Within a month the right leg also became so very painful that he was unable to walk. Marked color changes noted in feet.

April 18. Diagnostic procaine injection of right lumbar, first, second, third and fourth. Within five minutes marked increase of temperature. In ten minutes there was complete relief of pain, and patient was able to move leg vigorously. Alcohol injected; marked increase in temperature, and relief of pain to date. Foot normal in color.

June 4. Diagnostic procaine injection of left dorsal twelfth, lumbar first, second and third. Relief of pain; marked increase of temperature of foot. Alcoholic injection.

Result. Relief of pain; marked increase in temperature and normal color of foot persisting to date (fig. 1).

Case 3. J. M., male, age 55. Chief complaint. Paint in right foot, draining sinus following amputation of toe for gangrene. For six months before admission he had had severe pain in his right foot. Second toe amputated December, 1930, because of gangrene. Continuous pain followed, with constant drainage from amputation site. Foot cold and blue; no palpable vessels.

April 10, 1931. Diagnostic procaine injection right lumbar first, second and third. Within ten minutes complete relief of pain, marked increase in temperature of foot. The alcoholic injection resulted in relief of pain, increased warmth and marked improvement of color persisting to date. The draining sinus completely healed within ten days and has remained so. Rather severe alcoholic neuritis lasted for about two weeks.

Case 4. S. M., male, age 50. Chief complaint. Pain and cramps in right leg. Onset spring of 1928 with cramps and pain in right leg when walking. Forced to stop work in

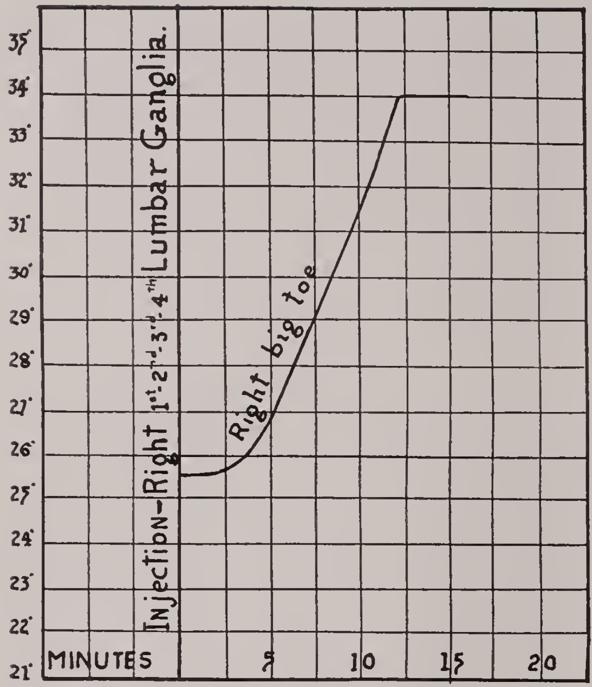

Fig. 1. Diagnostic injection.

Case 2. Diagnosis, arteriosclerotic endarteritis, Buerger's disease. Complaint: cold, painful extremities. Increase of 83° C. temperature, showing a marked element of vasospasm. Complete relief of pain. Injection of alcohol resulted in complete relief with same increase of temperature.

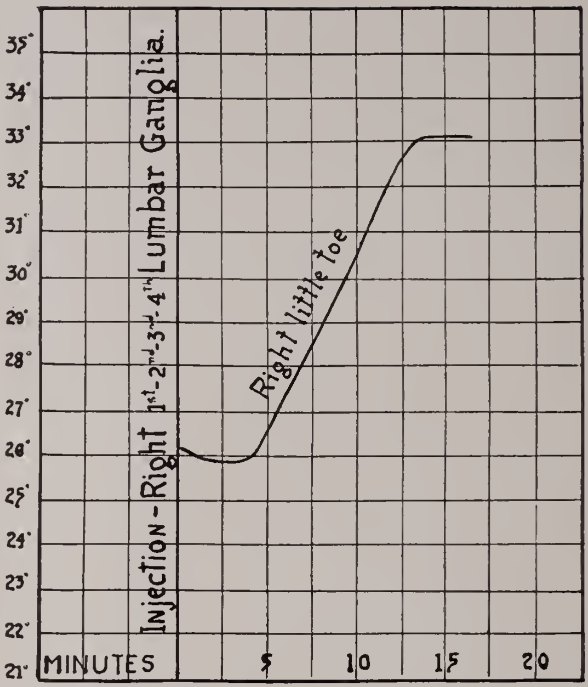

Fig. 2. Diagnostic injection.

Case 5. Diagnosis, arteriosclerotic endarteritis. Complaint: cold, cyanotic feet, claudication. Increase of 7° C. temperature. Foot became warm and pink. Pain completely relieved. Alcohol injected.

1929 because of pain. Relief obtained only when foot was elevated. Foot very dark blue when dependent, blanched when elevated; vessels not palpable; marked generalized arteriosclerosis.

April 22, 1931. Diagnostic procaine injection right lumbar first, second, third and fourth resulted in a rise of 7° C. and complete relief of pain. Alcoholic injection resulted in marked increase in temperature, marked improvement in color and relief of pain persisting to date.

Case 5. V. J., male, age 58. Chief complaint. Pain and discoloration of both legs. March, 1928, left hip broken. Several operations followed which resulted in an ankylosed hip and marked atrophy of the leg, making it functionally useless. March, 1931, began to experience severe pain in left leg and some pain in right. Within a month was having severe pains in both legs. There was marked generalized arteriosclerosis. The left foot was almost black and virtually gangrenous. The right foot was very dark blue when dependent and blanched quickly when elevated. Both feet very cold and painful.

April 10. Diagnostic procaine injection left lumbar first, second and third. Relief of pain and 10° C. increase in temperature within ten minutes. Alcoholic injection. Result. Relief of pain; marked improvement in circulation with increase in temperature.

April 20. Procaine injection right lumbar first, second, third and fourth. Result. Rise in temperature of 10° C., marked improvement in color and relief of pain. Alcoholic injection made these changes persist to date.

April 29. Amputation was done because of the functionally useless left leg. The wound healed well; a painless stump resulted. Only slight alcoholic neuritis in this instance (fig. 2).

Case 6. M. B., male, age 73. Chief complaint. Continuous pain in both feet, with coldness, burning and tingling of feet. Onset in 1919, intermittently. For past three years pain a constant symptom in both feet, this aggravated by motion. The feet became very cold, blue and extremely painful, if he walked a few blocks. The feet were also very cold and cyanotic when dependent, pale when elevated. Vessels not palpable. Marked generalized arteriosclerosis.

June 17, 1931. Diagnostic procaine injection of right lumbar first, second and third resulted in 10° C. increase in temperature and complete relief of pain. Alcohol injected.

June 24. Alcoholic injection of left lumbar first, second, third and fourth after procaine injection had relieved pain and caused marked increase in temperature.

June 28. Patient discharged from hospital completely relieved of pain, functional results perfect. Both feet warm. Stated he felt twenty years younger. Rather severe alcoholic neuritis several weeks duration.

Case 7. R. S., male, age 67. Chief complaint. Pain in left foot. Onset fourteen years ago, at which time he ran a nail through his foot. Since then the area has been indurated. Pain is present only at night and does not bother him when walking. Vessels are palpable, foot is warm and of normal color.

June 24, 1931. Diagnostic procaine injection of left lumbar first, second, third and fourth resulted in marked increase of temperature of left foot. But he was having no pain at the time of injection. Alcoholic injection. That night had recurrent attack of old pain. The foot was 8° C. warmer than the other one. It was decided that this pain was somatic rather than vascular, and not arteriosclerotic in origin.

Case 8. T. V., male, age 67. Chief complaint. Pain in both feet; gangrene of several toes of each foot. Onset August, 1930, with sharp pain in toes of both feet when walking. This gradually increased until the pain became constant day and night. Discoloration of toes first noticed in December.

Dec. 22. Bilateral LeRiche operation with alcoholic injection of femoral sheath. This gave marked relief of pain and improvement in circulation. The gangrene gradually cleared up. Patient left the hospital in May much improved, remained in fairly good health until the end of June, when he began to have pain in the left great toe, with recurrence of gangrene.

July 15. Diagnostic procaine injection left lumbar first, second, third and fourth. Pain was quickly relieved and the temperature increased 5° C. Alcoholic injection.

July 24. Patient discharged from the hospital completely relieved of pain and the gangrene entirely cleared up.

Note: All of these cases, with the exception of Case 1, were treated at the Harborview Hospital.

COMMENTS

There have not been enough cases to enable me to classify accurately the different types of pain. I feel that, if a careful study were made as to the kind of pain involved, we might be able to prognosticate which cases would be suitable for injection. My experience to date indicates that pain which is present only at night and not aggravated by exercise is not of sympathetic origin.

There is no good reason for any controversy as to whether or not the pain itself is carried over sympathetic channels. Personally, I am sure that it is. I feel that we shall have to revise entirely our ideas of pain and its pathways of conduction. This is a question for anatomists and physiologists to settle. Clinically, many types of pain are unquestionably sympathetic either in origin or conduction.

Untoward results. The neuritis which follows alcohol injection is unfortunate. In dorsal injections it is often very severe and may persist from two to six weeks. It is probably due to an actual somatic alcoholic neuritis. In the lumbar region it occurs in only about fifty per cent of cases and as a rule is not severe, although my first case was completely incapacitated for several weeks because of it.

I am now running a series of cases, including chronic arthritis, Raynaud's disease and Buerger's, in whom I am injecting one side and removing the ganglia on the other side. Because of the neuritis patients invariably prefer the operation to the injection, particularly in the dorsal region.

There is also uniformly present anesthesia of the distribution of the somatic nerves involved in the injection, usually in the groin and the inner side of the thigh. This gradually disappears.

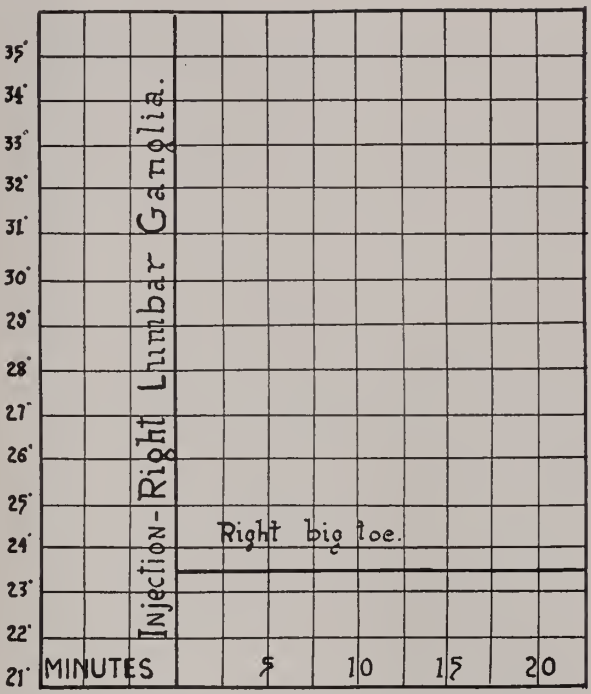

Fig. 3. Diagnostic injection.

H. R., age 33. Oct. 10, 1930. Diagnosis, Buerger's disease. Result, no increase in temperature of toe. The leg warmed to a sharply limited area just below the knee. From there down remained cold. Advised amputation above knee which was done.

There have been no other troublesome results in the lumbar injections. But in the dorsal injections there arises a considerable element of danger, due to the fact that the injection is made so close to the pleura, and the fibers of the heart and lungs are involved. Sudden collapse, which is not uncommon, can be remedied by using oxygen, stimulants and, if necessary, artificial respiration.

As to the permanency of the effect of alcoholic injection, time alone can determine. I do not feel that it will be permanent unless a direct ganglionic or trunk injection has been obtained. This, of course, is accomplished in very few instances. I have had a number of cases in which the vascular changes were apparent for only a few days to several weeks following injection, although relief of pain continued.

In cases in which gangrene has set in and the circulation is too much impaired to allow for healing, amputation is then indicated. In these cases diagnostic injection can also be used to indicate the level at which amputation may be safely performed. If alcohol is injected in these cases, a lower amputation is frequently made possible, with a greater assurance of a healing stump (fig. 3).

Injection versus surgery. Will alcoholic injection replace surgical removal of the sympathetics? I do not believe so. No doubt in some instances it will, especially in the lumbar regions. In the dorsal regions, however, I feel that surgical removal will always be preferable, if for no other reason than that of the attendant alcoholic neuritis. Therefore, we must be eclectic in our practice.

Surgery is such an exact procedure that one is able to remove certain ganglia and leave others intact. Injection is not so accurate, since one has no control over the spread of the injected fluid. The import of this becomes apparent in considering conditions of the upper extremities. When a unilateral effect on the arm is desired, I am able in most instances to avoid a Horner's syndrome surgically by leaving the inferior cervical ganglion intact. This is impossible by injection, and a Horner's syndrome always results, particularly distressing to the female patient.

Again, operative results are permanent, while the results of injection are uncertain. I feel that in such conditions as Buerger's disease, Raynaud's scleroderma, chronic arthritis, et cetera, where a maximum permanent vascular result is essential, surgical removal is preferable and alcoholic injection should be done only where surgical removal is contraindicated or unjustified. In painful conditions, such as described in this paper and which so frequently occur in late adult life, injection methods are to be preferred. Injection, of course, will have a much wider application because of its simplicity. Surgical removal, on the other hand, is a time consuming procedure, attended by technical difficulties. It requires special knowledge, special instruments and special assistance, and for these reasons will probably not become very widely used for some time to come.

SUMMARY

Eight cases of pain in the lower extremities due to vascular insufficiency of the arteriosclerotic type are reported.

In seven cases, diagnostic injection of procaine into the lumbar sympathetics completely relieved the pain. The injection of alcohol in these cases has resulted in complete relief of pain and marked improvement of circulation.

In one case, alcoholic injection produced increased vascularity but did not relieve the pain, indicating that the pathway of the pain was not sympathetic.

The relative merits of alcoholic injection and surgical removal of the sympathetics are discussed. Surgical removal is more accurate and permanent and does not result in the severe neuritis which attends the injections.

CONCLUSION

We have offered in this paper a very successful method of relieving pain due to vascular insufficiency of the arteriosclerotic type. Seven cases have been completely relieved and there has been but one failure.

If diagnostic procaine injection of the lumbar sympathetics relieves pain, the injection of alcohol will give permanency to this relief.

Alcoholic injection of the sympathetics following diagnostic procaine injections is much more satisfactory than the LeRiche type of operation, and will give a much higher percentage of cures.

It may be used accurately and much more effectively than the LeRiche operation for all the conditions for which this operation has been advocated.

Alcoholic injection of the sympathetics, while probably not permanent, may be used in some cases as a substitute for the surgical removal of the sympathetic ganglia.

Diagnostic injection of the sympathetics may be used to determine the proper level for amputation where this is necessary, and the injection of alcohol will allow a lower amputation and assure better healing of the stump. It should also cut down greatly the incidence of painful stump.

Effect of Hypothyroidism on Gastric and Intestinal Function. From the study of a group with lowered basal metabolic readings, a few cases of frank myxedema, or at least of the forme fruste, and a number of cases with readings lower than is usually regarded as a low normal reading, Thomas R. Brown, Baltimore (*Journal A. M. A.*, Aug. 22, 1931), draws the following conclusions: 1. There is no characteristic gastrointestinal picture presented by this group of cases, the digestive symptoms, gastric or intestinal, being purely functional in nature and not at all different from those encountered in a variety of other conditions. 2. It is evident, however, that hypothyroidism, especially if the readings are very low, plays a considerable part in certain cases of intractable constipation not corrected by the usual means, which are not infrequently observed in women in the late forties or fifties; the incidence of hypothyroidism in such cases is shown by the marked success in regard to these symptoms under proper dosage of thyroid extract. As regards the gastric secretory condition in those cases with relatively slight basal reductions, that is, with readings between minus 10 and minus 20, the readings are quite normal, and there is no difference between these readings and those obtained in normal individuals; that is, those with readings from minus 10 to plus 10. On the other hand, in the cases with very low readings, minus 20 and below, there was a marked tendency to gastric subacidity, a considerable portion of the cases presenting achlorhydria.

GALVANIC THERAPY*

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About 600 B. C. Thales of Miletus observed that when friction was applied to amber it attracted light bodies. Believing this indicated life in the amber, its Greek name electron was applied to this phenomenon. Hence the derivation of our word electricity.

For more than 2,000 years this frictional or static electricity was the only form of current known. Many references are available from the writings of a large number of authors, indicating its use in the treatment of diseases of muscles, nerves, hysteria and other neuroses and allied conditions. Many ingenious and curious forms of apparatus were devised for the application of this current in the treatment of the various diseases to which it seemed applicable.

As a therapeutic measure this was discarded, until its revival by Morton of New York about fifty years ago, when Galvani, in 1781, discovered the current which has been designated by his name. This was further elaborated by Faraday, in 1830, who discovered the induced or secondary current. Known universally as faradic current, this possesses many distinctive qualities which are utilized in the treatment of certain conditions. During recent years the galvanic has been modified into a variety of sinusoidal currents which have their distinct fields of application. In this presentation we are confining our discussion to the galvanic current which is considered by many as the most valuable agency employed in physical therapy and is the keystone of electrotherapeusis.

This is an undirectional current. That is, it always flows from the positive to the negative pole, with relatively low voltage and amperage, in distinction from the alternating current whose polarity is subject to frequent alternations. Naturally, in the past there has been much speculation as to the nature of the electric current. The physicists now agree that it consists of the passage between the two poles of myriads of electrons, the ultimate divisions of matter.

If we place in a body of distilled water the cords from the positive and negative poles of an electric battery, there will be no current between them, as shown by the needle of the milliamperemeter remaining at zero. If a soluble salt, such as sodium chloride, be added to the water, an immediate current passes between the electrodes, as indicated by the deviation of the needle. This soluble sodium chloride, known as an electrolyte, has been separated into its combined sodium and chlorine by the electric current, the positively charged sodium being attracted to the negative pole and the negatively charged chlorine to the positive. The sodium and chlorine are known as ions, from the Greek verb to travel, and this process of division is termed ionization or iontophoresis. The same phenomena occur when the current is applied to the human body, which is composed chiefly of water, holding certain salts in solution, the most abundant of which is sodium chloride. The passage of the electric current through the body is due to the rapid transmission of the electrons between the positive and negative poles, a process, as mentioned above, which is designated as ionization or iontophoresis.

The positive and negative pole each has its own characteristics which must always be kept in mind as they form the basis of therapy. The positive pole is alkaline in reaction and if applied to moistened red litmus turns it blue. It attracts oxygen and will corrode metals by the process of oxidation. It contracts and hardens tissues and is a vasoconstrictor, thus checking hemorrhage. It dries tissues by the expulsion of water. It is a sedative and, therefore, relieves pain such as is present in neuralgias and neuritis. Characteristics of the negative pole are the reverse of all these. Being acid in reaction it reddens blue litmus. Hydrogen collects about it in large amount and, if one is uncertain as to the polarity, its presence at one terminal in a mass of bubbles indicates the negative pole. It softens tissues which become moist by the attraction of water, this attraction of fluid from the positive to the negative pole being termed cataphoresis. It is a vasodilator and, therefore, promotes hemorrhage. It is an irritant and with a sufficiently strong current produces pain.

If the tips of the cords from the positive and negative poles are inserted into the ends of a pared potato and the current allowed to pass for twenty minutes, about the positive pole the potato is hard, dry and tightly holds the electrode. At the negative pole the tissues are soft and moist, due to the attraction of water, and the terminal is in loose contact. If in an excavation at the middle of the potato has been placed a solution of potassium iodide, the current has separated this into its constituent parts, the positively charged potassium being attracted to the negative pole and the negative iodine to the positive. Divide the potato through the sites of these poles and we find a deep blue discoloration about the positive, caused by the action of the iodine on the starch, where it has been collected about the positive terminal. In the meantime there is no discoloration of the potato between the positive pole and the excavation holding the potassium iodide solution, proving that the iodine has been concentrated at this pole.

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Application of the galvanic current in treatment of disease is based on the phenomena above described. This galvanotherapy will be presented under three headings: (1) The current used for the destruction of abnormal tissue, (2) the current employed for the introduction into the body of ions possessing therapeutic properties, (3) the current used to cause effects which cannot be attributed to the introduction of external ions, thus producing certain biologic results which are dependent on the action of ions which are normal constituents of the body tissues.

DESTRUCTION OF ABNORMAL TISSUE

Destruction of tissue is the result of electrochemical cauterization at one of the poles. At the negative electrode, or cathode, to which the sodium ions are attracted, these combine with hydrogen to form sodium hydroxide and hydroxyl ions. The protoplasm of the cells is destroyed by this caustic, forming alkali albumin, the coagulum thus produced being relatively soft. At the positive electrode, or anode, to which the chlorine is attracted, this combines with hydrogen, producing hydrochloric acid and oxygen, destroying the walls of capillaries and coagulating the blood. If the electrode employed is zinc we have a deposit of zinc chloride which acts as an acid caustic, destroying and coagulating cellular protoplasm. This form of electrochemical cauterization has the advantage over ordinary caustics in that the residual scars are soft and do not cicatrize. The reaction following treatment is mild, and its application can be accurately localized.

The technic consists in using for the active electrode a small rod or needle, commonly of zinc or platinum, the indifferent electrode consisting of a large pad moistened in sodium chloride solution, to which is attached a metal electrode. The vasoconstrictor quality of the positive pole can be utilized as a hemostatic for hemorrhage in the nose, mouth, ear or other cavities. Employing a suitable cervical electrode attached to the positive pole, this current is applicable for treatment of metrorrhagia. It is effective in treating certain kinds of small cavernous nevi, for the obliteration of stellate veins, often called spider nevi, and telangiectasis. A single application of the needle to the small venous accumulations found in these conditions is commonly sufficient for their disappearance. Larger cavernous nevi are more successfully treated by the bipolar method, in which needles from each pole are inserted parallel to each other at the border of the growth, the current destroying the vessels with production of tough coagulation of the blood and obliteration of the growth. This treatment is applicable for the removal of moles, warts and epitheliomata, but their destruction with a high frequency current is more effective and usually preferable.

The effect at the negative pole of dissolving tissue renders this applicable in the removal of certain scar tissue, where this is dense and hard, leaving a soft, pliable scar, free from cicatrix.

A lady who had been the victim of a beauty doctor had large deposits of paraffin on the cheeks and above the clavicles. A surgeon removed these accumulations with long incisions, resulting in a hard, thick scar above the whole length of the clavicles and upper border of the sternum. With several operations under novocaine anesthesia, using abundant amperage, these unsightly, hard scars melted away under negative galvanism, leaving soft, flat scars much preferable to the previous unsightly disfigurement.

The negative electrode also has been successfully used in the treatment of urethral stricture, an electrode being employed a little larger than the strictural opening. Under the action of the current the cicatricial tissue gradually melts away, permitting the passage of the electrode. By using instruments of graduated sizes the desired patency may be obtained. In a similar manner a stenosed cervical canal can readily be enlarged as desired without production of cicatricial contraction. Electrolysis for the removal of hair is accomplished by the insertion into the hair follicle parallel to the hair a needle of suitable size, connected with the cathode, while the indifferent electrode connected with the anode is applied elsewhere. If properly performed the hair follicle is permanently destroyed. There are other applications of each pole to conditions of disease which may be suggested by these descriptions.

INTRODUCTION OF THERAPEUTIC IONS

If suitable pads, soaked in dilute solutions of certain drugs and attached to metal electrodes, are connected to the galvanic current, these drugs will migrate into the tissues, this procedure being known as medical ionization or iontophoresis. In the past exaggerated and unwarranted claims have been made as to the results of this treatment. At one time it was claimed that iodine could thus be effectively applied for the treatment of goiter and salicylates for the relief of rheumatic joints. Introduction of iodine through the skin can be readily demonstrated by discovering its presence in the urine. It has been proven, however, that the amount of drugs thus introduced is so minute in quantity as to be ineffective for the therapeutic results desired. This is due to the density of the skin which precludes the passage of an effective quantity of the drug, while the multitude of capillaries carry the medicament into the general circulation, obtaining little if any local result.

In certain diseases and morbid conditions of the skin and mucous membrane, however, ions introduced by the galvanic current can exercise therapeutic effects. The available locations for such treatment are nasal cavities, antrum, frontal sinus, mouth, tongue, middle ear, conjunctiva, rectum, vagina, uterus and urethra. The usual treatment is by the use of ions of zinc, copper or mercury, zinc being most generally employed. Applied at the positive pole, they enter the base and edges of an ulcerated surface, exercising germicidal powers. Migrating into the cells they destroy protoplasm and form albuminates. Thus zinc albuminate deposits a wide covering on the surface which serves as a protective medium. Indolent ulcers may be stimulated by iodine ions from the negative pole with the production of active granulations.

A well known treatment is zinc ionization for chronic suppurative otitis media. The auditory canal is filled with 1 per cent zinc sulphate solution, into which is introduced a zinc rod electrode from the positive pole. Passage of the current forms zinc albuminate on all surfaces in contact with the solution. The germicidal effect destroys bacteria with resultant healing. This result cannot be expected, however, in the presence of eroded bone.

A patient with purulent discharge of the ear of several years duration, following suppurative otitis media, received this treatment. The immediate result was the cessation of the discharge. The treatment was repeated twice at weekly intervals. During the following year, when she was under observation, there was no return of the purulent discharge.

This form of treatment may be effective in chronic purulent affections of various sinuses, such as the antrum and frontal, provided a similar technic can be applied. Successful treatment of a suppurating sinus depends upon the ability to reach all its ramifications and the absence of bony erosion. Chronic indolent ulcers are often effectively treated by the application of a suitable pad soaked with zinc sulphate solution, connected by a metal electrode with the positive pole.

Many cases of chronic endocervicitis are subject to successful treatment by this method. Suitable electrodes are prepared of zinc, copper or mercury, the most commonly used metal being zinc. Introduced into the cervix and connected with a positive pole, ions of these metals are deposited on inflamed surfaces, penetrating to the racemose glands with wide-spread deposits of albuminates of the metals. Some writers prefer an initial treatment from the negative pole which introduces hydroxyl ions with a softening effect on the tissues, accompanied by a very watery discharge. It is claimed that subsequent treatment with the positive zinc ions is thus rendered more effective.

A fortunate result was obtained in the case of a young woman who had experienced induced abortion two years previously, soon after marriage. There had been a continuous distressing leucorrhea during this period. One treatment of zinc ionization checked this discharge and there was no return during the following year, during which she was under observation.

As a rule, however, a series of treatments is necssary to anticipate satisfactory results. Many other applications of this treatment may be made by methods similar to these already described.

IONIZATION WITHOUT INTRODUCTION OF THERAPEUTIC IONS

The galvanic current can bring about certain biologic effects in the tissues of the body without destructive changes or introduction of ions, such as already mentioned. The process of iontophoresis, previously described, progresses by the ionizing action of the current on the soluble salts in the body tissues, chiefly sodium chloride. The current is introduced by the application of thick pads soaked in a saline solution, to which are attached metal electrodes connected with the two poles. By this means currents of much higher amperage and longer duration are employed than in the processes previously described. During the passage of the current vasodilatation occurs with increased temperature at the site of the disease, accompanied by hyperemia which is active in removing pathologic products.

Also there is probably some effect from cataphoresis, already mentioned, by which there is a tendency to abstract water from the site of the anode or positive pole, toward the cathode or negative pole, thus aiding in the reduction of edema. The relief of pain by the galvanic current is caused in part by the process of counterirritation affecting the terminal nerve fibers which exerts a sedative effect, as frequently follows the application of certain ointments and liniments. For the relief of pain the electrode connected with the positive pole is ordinarily applied to the site of the pain, the larger, so-called indifferent electrode, being used at a distant part of the body. In some cases it is preferable to place the electrodes at opposite sides of the body or limb under treatment. In some cases, as in sciatic neuritis, the active electrode may be applied to the site of exit of the nerve, the extremity being immersed in a saline solution, in which is placed the electrode from the other pole.

Probably the most valuable therapeutic results are obtained from the absorption of inflammatory products. One notes the decrease of pain and swelling in cases of trauma or those caused by inflammatory exudates. Often the absorption of hematomata resulting from trauma or other causes may be promoted by this current.

A young lady received a blow in the calf from a golf ball, producing a painful induration about two inches in diameter, composed of a blood clot. About a week later she received a treatment with the cathode over the tumor and the anode on the opposite side of the leg. After three treatments the swelling had practically subsided.

A man of sixty years developed an extensive hematoma in the calf, of apparently deep thrombotic origin, extending from the popliteal space to the lower third of the leg. He appeared for treatment six weeks later, walking with a crutch and cane, when absorption of the clot was beginning. He received three treatments at two day intervals, a marked decrease of the swelling following each treatment. At the end of this period only a few small nodules remained.

There is a wide field for use of the galvanic current in nerve injuries, resulting either in neuritis or paralysis. Mention has already been made of the analgesic effect from the positive pole. In a given case one may need to exercise ingenuity to make proper applications of the electrodes, and judgment is needed to determine the suitable amperage. Defective nutrition in paralyzed muscles may be benefited by this current. Fibrosis and adhesions involving nerves and muscles may be reduced by use of negative galvanism, due to the softening effect of the cathode, amperage being employed to the degree of tolerance. In treating paralyzed muscles one needs to avoid excessive zeal and to remember that too lengthy or too strong applications may be harmful and defeat the object to be attained.

Contraction of a paralyzed muscle does not accompany the continuous application of the galvanic current but it occurs with its make and break. Hence the usefulness of the interrupted current. Also one must consider in a given case the advisability of employing the faradic, sinusoidal or static currents, as well as massage and diathermy, any of which may be needed to aid in restoration of function. Whether or not the reactions of degeneration are present will be a factor in determining which agency is to be selected and when it is to be replaced by another. At this time these features cannot be considered.

This paper has not aimed to discuss completely the therapeutic applications of the galvanic current but the desire has been to call attention to principles involved in its use with sufficient detail to suggest its wide adaptability. There are many conditions of disease not mentioned herein, for which this line of therapy may be recommended, that are worthy of consideration. One must always keep in mind that this is not a harmless method of treatment, if applied carelessly and without recognition of possible injury to tissues. If, however, it is used with intelligence and discrimination it is a valuable addition to our equipment for the treatment of disease.

MECHANISM OF EDEMA IN RELATION TO CLINICAL CLASSIFICATION OF BRIGHT'S DISEASE (NEPHRITIS). Henry A. Christian, Boston (*Journal A. M. A.*, Aug. 1, 1931), has found edema a very useful basis of classification of Bright's disease along with a time division into acute, subacute and chronic. Using these criteria he has formed a clinical classification that has been very helpful. Properly to apply edema as one of the criteria of classification of Bright's disease or nephritis necessitates a reasonable understanding of the pathologic physiology of edema, and although the mechanism of edema is very complex and as yet far from thoroughly understood, recent investigation carried on in many different laboratories has added much to the knowledge of it, so that one is in a position so to formulate this knowledge as to aid in an understanding of the several types of Bright's disease. It is obvious that edema or the appearance of abnormal amounts of fluid in tissues and body cavities does not arise always from the same cause or, so to speak, does not always have the same mechanism. This permits one to subdivide edema into seven clinical varieties: cardiac, hepatic, renal, nutritional, anemic, inflammatory and anaphylactic edema. Of these varieties of edema, cardiac and hepatic edema have a very similar mechanism; in the same way renal, nutritional and anemic edemas are closely related as are inflammatory and anaphylactic edemas. In the mechanism of these several varieties of edema there are concerned six significant factors: filtration pressure, osmotic pressure, permeability of vessel wall, salt content of the tissues, lymphatic drainage and nervous control.

ZOSTER INFECTION

RECENT INVESTIGATIONS OF ITS NATURE, WITH HISTORIES OF TWO UNUSUAL CASES*

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It is my intention to report some cases of the rarer types of infection due to the zoster virus. These shall be preceded by a short review of the relationship between zoster and varicella. They shall be supplemented by notes on the treatment of zoster with the extract of the posterior lobe of the pituitary gland.

Some of us ignore the study of the filterable viruses because it seems too academic to be of practical value. This tendency may be partially due to the variety of speculations which has confused our knowledge of them, for investigators have variously guessed them to be a form of life, a chemical product of diseased cells and enzymes.[1] Though we have no single criterion of life, the filterable viruses have these traits which are characteristic of living things, that they can multiply, assimilate from the surrounding medium without loss of individuality and adapt to altered environment. As a group, the filterable viruses merge gradually into the bacterial group, and as this simplest premise of life is supported by the known evidence, it is the most reasonable.

Within the limits of visibility are the bodies in vaccina virus, the virus of psittacosis, and that of fowlpox. The spherula insularis of disseminated sclerosis, which has recently been discovered by Miss Kathleen Chevassut,[2] will be in this group, if her work is corroborated. It is a fact that diseases due to the filterable viruses produce an immunity, active in smallpox and rabies, passive in measles and zoster, which is associated with the development of specific antibodies. I shall restrict my remarks to the viruses of zoster and varicella.

Zoster occurs more frequently in the early summer and late autumn. It has been proven to be a communicable disease.[3] Small epidemics have been described. One attack usually confers a permanent immunity.[4] The eruption, which is frequently preceded by malaise and fever, is followed by an enlargement of the neighboring lymph glands. There are inflammatory changes in the skin and nervous system which originate in the first sensory neuron. The ganglia of the posterior roots of the spinal nerves and their cranial homologue, the gasserian ganglion, are most frequently affected but the peripheral nerves may be involved. It has been communicated to children by direct cutaneous inoculation.[5] From these facts it is concluded that zoster is infective in nature.

There is a clinical type of zoster of which we can find the cause, for it is symptomatic of such intoxications as are found with arsenic, bismuth, carbon monoxide and other poisons; or it may complicate pneumonia, tuberculosis, syphilitic radiculitis, or spinal compression following vertebral metastases in carcinoma; in another type no predisposing cause can be found. However, histologic studies and the test for the fixation of complement have proved that symptomatic zoster and idiopathic zoster are identical. A primary lesion, be it from trauma or toxin, lowers the resistance of the ganglion of the posterior root of the spinal nerve to the zoster virus; once the virus invades the sensory neuron it proceeds peripherally towards the neuraxis. Therefore, the cutaneous lesions are a true zoster dermatitis. They are not due to a vasoparalysis as used to be supposed.

Zoster is seen in various forms. There is the ophthalmic type[6] due to an affection of part of the gasserion ganglion which may manifest itself as small, round infiltrations of the cornea, or as an optic neuritis with subsequent atrophy, or as a paralysis of the third, fourth or sixth cranial nerves. Therapeutic injection of alcohol into this ganglion may be followed by a zoster infection. The geniculate ganglion of the seventh cranial nerve may be affected. Usually this causes vesicles in the auricle or on the fauces, pain in the ear and mastoid region, and loss of taste of the anterior two-thirds of the tongue on the same side. Facial paralysis is almost always present.

It is well to remember that the vesicles may be so inconspicuous that they are easily overlooked. In the spinal cord the inflammation may spread to the anterior horns to cause segmental paralysis. A rarer form of the infection is an acute zoster arthritis. In the eight cases which have been described the interphalangeal joints of the fingers were always affected, and the wrist-joint in one case. The severe pain and edema which may persist for months are followed by great limitation of movements. These changes are in the periarticular structures, not the bones. Since the zoster virus can spread along the nerves to reach the cornea, the skin or the fauces, it is supposed that it reaches the joints by a similar route. The zoster virus may attack other parts of the nervous system and produce a meningitis or an encephalitis.[7] At least two fatal cases of zoster meningoencephalitis[8] have been reported.

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* From Everett Clinic.

* Read before a meeting of Snohomish County Medical Society, Everett, Wash., March 10, 1931.

[1] Brain, W. R.: Zoster, Varicella and Encephalitis. Brit. M. J., 1:81-84. Feb., 1931.

[2] Chevassut, K.: Etiology of Disseminated Sclerosis, Lancet, 1:552-560. March 15, 1930.

[3] McCormick, R. R.: Herpes Zoster with Varicella; a Clinicopathologc Study. J. A. M. A., 96: 766-770. Mar. 7, 1931.

[4] Low, R. C.: Herpes Zoster, Its Cause and Association with Varicella. Brit. M. J., 1:91. Jan. 25, 1919.

[5] Cleveland, D. E. H.: Consecutive Herpes Zoster and Varicella, with Varicella in Contact. Can. M. A. J., 17: 1299-1304. Nov., 1927.

[6] Paton, L.: The Trigeminal and its Ocular Lesions. Brit. J. Ophth., 10:305-342. June, 1926.

In 1888 von Bokay first noticed an association between zoster and varicella; in his case, zoster in one individual was followed after ten days by varicella in a contact. This is still the most frequent sequence.[9] Since then many cases have been reported, even a series of two hundred and thirty in France. The incubation period varies from seven to twenty-four days. Most interesting is the fact that, just as the idiopathic zoster causes varicella, the zoster which follows arsenical treatment may cause varicella in a contact. Varicella may cause varicella and similarly zoster may breed true. All possible combinations of infections by and from these two have been reported; as an instance, contact with a zoster patient may cause zoster in one patient and varicella in another. Both zoster and varicella may occur simultaneously in the same patient. In Vienna they have found that the monthly incidence of both diseases, which is greatest in the autumn, corresponds for nine of ten consecutive years.

Heretofore we have been unable to diagnose the diseases due to the filterable viruses until they were quite advanced and the clinical picture was unmistakable. If treatment is ever to become effective, it must be begun in the early stages. The reaction of complement fixation (Bordet-Gengou reaction)[10] is given by an antiviral serum in the presence of the specific virus. Gordon has used it in the investigation of the vaccinia and smallpox viruses; Bedson and Bland[11] have used it with vaccinia, smallpox, herpes and zoster. The results have been highly satisfying. They have shown that antibodies to varicella are in the blood of zoster patients and vice versa. It is true that no one has discovered the final evidence that the same virus causes both varicella and zoster but the facts certainly tempt one to make such a conclusion. Also, the facts suggest that adults possess an immunity to varicella virus but that this wanes; and the adult who becomes susceptible develops zoster rather than varicella.

In the investigation of zoster, convalescent serums have been used entirely because of the lack of suitable animals with which to experiment. Brain and Bedson report a case of a patient who had an extensive zoster of the head and neck, and who subsequently developed an encephalomyelitis. They proved their diagnosis to be correct by finding that the fluid from the vesicles and the cerebrospinal fluid both fixed the complement in the presence of a known zoster convalescent serum.

Of my seven cases of zoster, two have interesting syndromes, though the other five received the extract of the pituitary gland. None had had varicella.

Case 1. The patient was a white female aged three years. Her family, past, and personal histories were irrelevant. She was brought to an oculist for advice about a drooping left eyelid.

Three days previously her father had noticed that the eyelid was beginning to droop, that she could not raise it as far as normally and that she was feverish, irritable, listless, drowsy. Two days previously she had vomited twice; had a fever of 103°; was more irritable and listless; and the eyelid seemed to droop more. She complained of no pain.

At my first examination the only positive finding was a paralysis of the left oculomotor nerve, causing ptosis and an external strabismus. The pupils were equal, round and reacted to light. The fundi were normal. There was no rigidity of the neck. The reflexes were normal. The urinalysis and Wassermann tests were negative. For two weeks she was listless, drowsy and irritable. Her temperature ranged from 99° to 104°. She had no appetite. She did not vomit. Placebos were given as palliatives.

The diagnosis is based on the sudden onset, malaise, the fever, the absence of permanent damage and the complete recovery. I could elicit no history of contact with varicella or zoster. The symptoms suggested an encephalitis with a rapid and complete paralysis of a cranial nerve. I had no facilities at my disposal with which to perform the test for fixation of complement.

Case 2. The patient was a white married woman aged twenty-five years. Her father had had rheumatic fever. In the past she had had a double salpingectomy, drainage of an antrum, appendectomy, mastoidectomy and tonsillitis. The menstrual history was normal.

She had been entirely well until a week prior to examination, when she had a severe ache over the top of her head and vomited. She felt ill, feverish and nauseated; she had no appetite; she was constipated. She awoke the next morning and immediately noticed that she was "seeing double" and that her left eyeball was turned medially. She consulted an oculist who prescribed expectant treatment till a Wassermann test was taken. It was negative. At that time she had a fever of two degrees.

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[7] Bedson, S. P.: Filterable Viruses and Practical Medicine. Can. M. A. J., 24:36-42. Jan., 1931.

[8] Schiff, C. I. and Brain, W. R.: Acute Miningoencephalitis Associated with Herpes Zoster; Fatal Case. Lancet, 2:70-71. July 12, 1930.

[9] Hill, N. G.: Herpes Zoster and Varicella. Brit. J. Chil. Dis., 26:193-200. July-Sept., 1929.

[10] Netter, A. and Urban, A.: Le virus varicello-zonateux. Ann. de l'Inst., Pasteur, 46:17-26. Jan., 1931.

[11] Bedson, S. P. and Bland, J. O. W.: Simple Method for Determining Electrical Charge Carried by Virus Particles. Brit. J. Exper. Path., 10:67-70. Feb., 1929.

When I examined her she still had a steady, severe aching over the left eye, a fever of five degrees and a furred tongue. She was not nauseated nor had she vomited since the onset. There was a paresis of the sixth cranial nerve on the left side, resulting in a weakness of the lateral rectus muscle with internal squint. The pupils were equal, round and reacted to light. The fundi were normal. Physical examination was otherwise negative and the reflexes were normal.

Four days later, the paresis of the sixth nerve had progressed to paralysis but the symptoms and signs of the general infection had lessened. She had a fever of two degrees but felt quite well. The ache over the eye, which recurred occasionally, was slight.

The Wassermann test was thrice taken. Thrice it was negative. I have regretted ever since that I gave her antisyphilitic treatment, for I am convinced that it did not benefit her, though it obscured my investigation. It served as a placebo only. Seven weeks after my first examination the eye had recovered entirely. She has been well ever since, with no sequelae. I could elicit no history of contact with varicella or zoster.

A nuclear or infranuclear lesion was diagnosed. The differential diagnosis included gumma, tumor, aneurysm, basal meningitis and zoster. The sudden onset, the symptoms and signs of an acute infection, the rapid and complete recovery were certainly in favor of zoster. Only the test for fixation of the complement could have finally decided the diagnosis.

In the other five cases I used the extract of the posterior lobe of the pituitary gland as a means to lessen the pain and to hasten the disappearance of the vesicles. Sidlick[12] recommends one-half to one cubic centimetre given daily into a muscle until the pain is relieved. Pregnancy is the only contraindication. The only untoward effect is a transient sensation of faintness which may occur.

In one patient with zoster of the forearm, I gave one cubic centimetre with no relief; this was repeated the next day with a moderate degree of relief; and an injection the third day gave complete relief. In another case with zoster of a segment in the lower thoracic region, one cubic centimetre the first day gave no relief, but one on the second day gave complete relief. In the third patient who had zoster of one segment in the upper thoracic region, no relief was obtained from the first two injections and the patient refused further treatments. The fourth patient had zoster of the entire length of the medial side of his arm. The first two injections were of no avail and the third gave moderate relief; the fourth was followed by complete relief. In the fifth patient, who had zoster of the upper thorax and arm, I gave two cubic centimetres daily for four days with no relief.

Thus three cases seem to have been benefited, though it is impossible to state with finality that it was due to the extract of the pituitary gland.

Three of these cases were referred to me by Drs. Gunderson and Secoy. I acknowledge my indebtedness to their courtesy.

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[12] Sidlick, D. M.: Use of Solution of Pituitary in Herpes Zoster. Arch, Dermat. and Syph., 22:91-93. July, 1930.

AN ACUTE EXACERBATION OF MORBUS MENIERI

ACCOMPANYING HERPES ZOSTER OF THE THORACIC REGION[*]

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Herpes zoster, with its suggested relation to herpes febrilis, chickenpox, smallpox, encephalitis and anterior poliomyelitis, has come into prominence and we no longer think of the condition as just another case of shingles. Morbus menieri or Meniere's disease has come to be classified as a definite syndrome after considerable chaos, in which the etiology, pathology and Meniere's varied description of the same case published thirteen years apart have received considerable comment.

Dedering[1] uses the term to designate a group of cases, in which either the acoustic or static functions of the ear are affected and in which no demonstrable cause, such as syphilis, parotitis, encephalitis, tumors, hypertension, professional disease of the ear or disseminated sclerosis, can be found. There is usually a marked variation in both the acoustic and static functions of the ear in as brief a period as a few hours in these cases.

Herpes zoster of the external ear, associated with paralyses of the facial, acoustic and static functions of the ear are fairly common and interesting reports are given by Dennis,[2] Sears[3] and Stewart.[4] The following classification has been used since it was given to us by Hunt[5] in 1907:

I. The syndrome and its clinical types:
  A. Herpes oticus.
  B. Herpes oticus with facial palsy.

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[*] Read before a meeting of Providence Hospital staff, Everett, Wash., April 27, 1931.

[1] Dedering, Dida: Clinical and Experimental Examinations of Patients Suffering from Morbus Menieri. Acta Otolaryngol. (Supp. 10), 1:1-156, 1929; (Supp. 11) 2:1-213, 1929.

[2] Dennis, F. L.: Herpes Zoster Oticus, Laryngoscope, 9:665-674, Sept., 1925.

[3] Sears, W. H.: Herpes Zoster Oticus. Ann. Otol., Rhin. and Laryn., 36:361-386, June, 1927.

[4] Stewart, J. P.: Herpes Zoster Oticus. J. Laryn. and Otol., 42:665-673, Oct., 1927.

[5] Hunt, J. R.: Herpetic Inflammation of the Geniculate Ganglion. J. Nerv. and Ment. Dis., 34:73-96, 1907.

C. Herpes oticus with facial palsy and hypoacousis.
D. Herpes oticus with facial palsy and Meniere's complex.

II. Subgroups of the syndrome:
A. Herpes facialis, with facial palsy and auditory symptoms.
B. Herpes occipitocollaris with facial palsy and acoustic symptoms.
C. Herpes zoster of the cephalic extremity with auditory nerve complications.

The case that I am reporting is unusual in that the area of herpes was in the lower thoracic region, and again more unusual, in that the condition occurred as an exacerbation of an already established case of morbus menieri.

CASE REPORT

J. B., age 26, a logger, first seen on December 30, 1930, on account of sudden loss of hearing in the left ear. There had not been any deafness in the family at any time. The past history disclosed a tendency to hemorrhage after a tonsillectomy and after extraction of teeth. He had suffered a head injury two years before.

The hearing in the right ear had been slightly affected for six years and markedly affected during the past six months. A disturbance in equilibrium had manifested itself during the past year by an inability to get about in the dark without staggering. As far as he could determine the hearing in the left ear had been normal when he retired the evening before he reported for examination.

He was a well developed young man who was physically negative excepting the ear condition, two devitalized teeth, small tonsil tags, and an area of herpes zoster on the left thoracic region. He was totally deaf to the loudest shout in both ears. He could not hear any sound by bone conduction with forks ranging from C to C4. Mass douching with cold water brought no response from the semicircular canals on the right nor from the horizontal canal on the left. There was a definite response from the vertical canals on the left. The blood and spinal fluid were negative to the Kolmer test and the spinal fluid count showed six cells. On account of the history of bleeding, the bleeding time, coagulation time and platelet count were taken several times and were always within normal limits.

Pilocarpine sweats and hot packs were given every other day for a period of two weeks, with large doses of magnesium sulphate on the alternating days. This treatment had to be discontinued on account of constant bleeding, following the extraction of the two devitalized teeth which necessitated suturing the sockets on three occasions before it was controlled.

The hearing was gradually improved with marked remissions, varying from the total deafness first seen to ability to hear a conversational voice at twenty feet. It was interesting to note that very marked variations could occur in twenty-four hours.

The area of herpes cleared in about two weeks, and there has been no postherpetic neuritis. The hearing still varies but he can always hear a conversational voice. The hearing for bone conduction or the response of the static apparatus have not improved after two months.

That herpes zoster is an infectious disease in many cases and that a filterable virus is the cause has been well established by Goodpasture.[6] It has been shown that contact with a case of herpes zoster may develop zoster and that small epidemics of the condition have occurred. More interesting still is the relation between varicella and zoster. A contact with varicella may develop zoster and vice versa.

As stated before, we include those cases in which no etiologic factor can be found in the classification of morbus menieri and this, of course, precludes a discussion of its etiology. However, the establishment of the affinity of filterable viruses for the nervous system, as demonstrated in rabies and poliomyelitis and suggested, but not proven, in disseminated sclerosis, together with the frequency of association of herpes zoster and nerve paralyses in general and affection of the auditory and static function of the ear in particular, opens a field for speculation.

It is a thought that in cases of idiopathic nerve involvements, such as manifested in the Meniere complex, we are too prone to conclude that the etiology must be on a luetic basis in spite of negative blood and spinal fluid tests, and in the absence of the stigmata of hereditary syphilis. We should keep in mind that the areas of accompanying herpes can be in a distant segment from the nerve involvement and may not always be visible to the casual examination or apparent to the patient himself. They may be in the pharynx or even in the esophagus, as recently reported by Jackson.[7]

The treatment in these cases is the treatment of the Meniere complex with or without herpes zoster. Elimination is increased by catharsis and diaphoresis and the intake of fluids is restricted. The use of a solution of pituitary is recommended by Turvey[8] for control of the pain of the peripheral lesions, but its beneficiary effect on the centrol condition has not been established.

CONCLUSIONS

1. A group of cases involving the auditory and static functions of the ear may be, for the sake of common understanding, classified as morbus menieri or Meniere's complex.

2. Herpes zoster of a distant segment may accompany affections of the auditory and static functions.

3. The zoster may accompany an exacerbation of an already established case of morbus menieri.

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[6] Goodpasture, E. W.: Herpetic Infection with Especial Reference to Involvement of the Nervous System. Med., 8:223-243, 1929.

[7] Jackson, C.: Diseases of Esophagus; Angioneurotic Edema, Urticaria, Serum Disease and Herpes. Arch. Otolaryng., 11:397-402, Apr., 1930.

[8] Turvey, S. E. C.: Zoster and Varicella. To be published.

NORTHWEST MEDICINE
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of the Pacific Northwest

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EDITORIAL

THE SATISFACTORY ABERDEEN MEETING

During periods of financial stress the attendance at medical meetings is naturally somewhat restricted. Such a condition was anticipated at the Washington Association meeting at Aberdeen last month. The attendance, however, greatly surpassed expectations with consequent satisfaction to all concerned. The registration numbered about two hundred and thirty, all sections of the state being represented. Several well known men were in attendance from Oregon. The presence of Drs. Coffey, Else and Bettman of Portland helps to make a Washington meeting seem natural, and it is always a pleasure to greet them. In addition was Dr. Pilkington of Astoria who had a few new stories to relate. Of what value would be a medical meeting, if there were lacking the opportunity of meeting old friends?

The first day was devoted to the universal ancient game of golf, to which a large proportion of the medical profession are confirmed devotees. All sections of the state were represented in the contests, and consequently one might have expected the trophies to have been widely disseminated. On the contrary, however, the Yakima contingent captured a major portion, as has become their custom in these annual tournaments. Such a result is to be anticipated when one contemplates a champion in their midst as is Dr. John P. Loudon, who also closely approaches the national medical championship. Since the group also includes several near-state champions, all other sections need to look closely for the securing of golf honors. A profusion of trophies was offered so that even the dubs had no occasion to complain for lack of recognition.

The scientific program presented an interesting group of papers, several of which introduced new subjects, demonstrating originality among members of the Washington profession. Later publication of these papers will reveal to the physicians of the state, who were not present at the meeting, that they missed a treat by failing to hear the original readings. The eastern guests, Drs. N. A. Campbell of New York, F. J. Cotton of Boston, and J. B. Beardsley of Philadelphia, made a lasting impression upon the auditors. Each presented a paper on an important subject dealing with his specialty, which contained the latest data obtainable relative to the disease under consideration. It was a pleasure to meet these men socially, aside from the scientific sessions. It was gratifying to demonstrate to the medical representatives from the East that the profession on the Pacific Coast is alive to the latest medical progress, and that they are in close touch with the leaders of the profession in other sections of the country.

The social events began with a dinner at the termination of the golf tournament which assembled all the physicians in attendance at that date. It was a jolly occasion with an abundance of good fellowship and a liberal supply of professional music, intermingled with the more or less demonstrative and somewhat inharmonious offerings from the musical members of the profession. A noticeable feature of this meeting was the large attendance of wives, which always adds greatly to the pleasure of such an occasion. They were delightfully entertained by wives of Grays Harbor County Society members at Pacific Beach Hotel on Tuesday afternoon, and their presence at the dinner completed the joy of the evening. Nothing is more impressive than the varying moods of the mighty Pacific. One never tires of contemplating the onward rush of the waves and their rumblings on the shore. At this beach one observes such scenes to his satisfaction. This is truly an asset to the residents of Aberdeen.

The business affairs of the State Association occupied much time in the House of Delegates. There was an interesting play of politics which engaged the earnest attention of a liberal attendance of delegates. There is undoubtedly much more interest in the administration of a state organization when different viewpoints elicit contests which keep the members alive to the proceedings. The schedule for the sessions of the House of Delegates is open to just criticism. It should be arranged so that its meetings do not conflict with the scientific program as occurred at this time. The members should not be deterred from attending the reading of papers. Neither is it complimentary to the essayists to realize that a large group of members are at the same time engaged in the business affairs of the organization. These two meetings might easily be set for different hours and thus avoid conflict.

Dr. Arvid Anderson, this year's president, and the profession of Aberdeen are to be congratulated on the success of this meeting, and they are assured of the gratitude of all in attendance for the attractions and pleasures which were presented. Although this was the first meeting of the State Association to be scheduled for Aberdeen, those privileged to attend will anticipate with satisfaction the occasion when this city shall again be selected for the annual assembly.

WASHINGTON PUBLIC HEALTH LEAGUE

On the second day of the Aberdeen meeting, the usual annual meeting of the Public Health League was held, in connection with a luncheon which was attended by a large assembly. It was flattering and gratifying to note the widespread interest in the League, as indicated by those who gathered to learn of its activities during the past year. Miss Helen Wilcox, executive secretary, reviewed the work of the organization, telling of its accomplishments and its satisfactory financial standing. It was also gratifying to hear the testimony of those familiar with the situation that the executive secretary has been held in high esteem at legislative sessions, and her work has been satisfactory and effective in connection with medical legislation.

The chief speaker at the luncheon was Dr. H. C. Watkins of Hoquiam, member of the House of Representatives during the last two sessions. He described the formation of house committees, detailing some of the duties devolving upon each. He emphasized particularly the need of physicians in both branches of the legislature. He stated there should be at least three in the House and two in the Senate, who by serving on suitable committees would exert needed influence on legislation pertaining to the health of the people of the state. There are always numerous legislators from the legal profession, who are thus enabled to direct suitable legislation along important legal lines. For the best welfare of the citizens medical members are equally important in the legislature. Dr. Watkins laid emphasis upon the importance of the selection of medical legislators from the larger counties of King, Pierce and Spokane. He pointed out the important influence that could be exercised by such men on some of the important committees in both branches of the legislature.

At the meeting of the House of Delegates the question was introduced of incorporating the Public Health League into the State Association, making the cost of its maintenance an item in the dues of each member. Attention was called to the fact that the results of the labors of the League are of equal benefit to all members of the State Association. It does not seem just that the cost of maintaining this organization should rest upon a small proportion of the membership who voluntarily contribute to its support. For a number of years the cost of maintaining the Oregon League has been incorporated in the annual dues of the state society. A committee was appointed to study the situation, with special attention to its functioning in our sister state. The importance of the Public Health League and its useful sphere of activity is universally recognized, and was not questioned by any one. It has an equally extensive field for needed activity during future years.

THE IDAHO ANNUAL MEETING

The annual meeting of Idaho State Medical Association, to be held at Boise September 29-30, promises to be one of special interest. The sessions will be held in the Senate chamber of the State capitol building. The scientific sessions are scheduled from 9 a.m. to 1:00 p.m. The afternoons will be devoted to golf, teas, etc., with the annual banquet in the evening of the first day. The dinner speaker for this occasion will be Dr. F. M. Loomis of Oakland, Calif., formerly associate professor of gynecology at the University of Michigan. He has recently traveled through Russia, and will speak on state medicine of that country.

The following papers will be presented by the guest speakers:

"Treatment of Head Injuries; Neurosurgical Topics," Dr. Howard C. Naffzier, clinical professor of surgery, University of California.

"The Therapeutic Pool, Used for Surgical Follow-up." Dr. Chas. L. Lowman, chief surgeon and director of department of educational activities, and trustee of Orthopedic Hospital School, Los Angeles.

"Chronic Sinus Infection, in Relation to Systemic Diseases;" "Experimentally Produced Focal (Dental) Infection, in Relation to Cardiac Pathology." Dr. Noble Wiley Jones, Portland Clinic, Portland, Ore.

"Surgical Treatment of Empyema." Dr. Ralph C. Matson, assistant professor medicine, medical department of University of Oregon.

"Hospitalization of Tuberculosis Patients Under Recent Act of Idaho Legislature," Dr. W. E. Stallings, U. S. Veterans' Bureau, Boise.

Paper by Dr. Harold G. Garwood, orthopedist, Denver, Colo.

Treatment of Chorea by Induction of Fever. Lucy Porter Sutton, New York (*Journal A. M. A.*, Aug. 1, 1931), has treated twenty-four choreatic patients with intravenous injections of typhoid-paratyphoid vaccine as a means of producing fever. The results thus far have been good. There has been prompt cessation of the symptoms, and the course of the disease has seemed to be greatly shortened.

THE OREGON MEETING AT EUGENE

Members of Oregon State Medical Society are looking forward to their fifty-seventh annual meeting which will be held Oct. 22-24 at Eugene, that delightful little city in the heart of the Willamette Valley. A full and interesting program is promised with some thirty papers already submitted by members, and with several outstanding addresses to be given by prominent speakers. Among the latter are Drs. Alfred C. Reed and Hans Lisser of the University of California Medical School faculty; Henry C. Dixon, newly appointed Associate Professor of Neuropsychiatry at University of Oregon Medical School, who is coming this fall from the Colorado Psychopathic Hospital at Denver; and J. Tate Mason of the Mason Clinic, Seattle.

The education of the lay public occupies a prominent place on the program. Thursday evening, at a meeting for the public, Dr. Alfred C. Reed will speak on "Health Lessons from the Orient," and a motion picture, "Many Happy Returns," will be shown. At the annual meeting of the Oregon Public Health League on Friday noon, Senator J. C. Booth will discuss "The Basic Science Act," a subject of considerable interest to Oregon medical men. Visiting wives will find their time well taken up by golf, teas, luncheons, exhibits, and rides in and about the attractive city of Eugene. Business meetings of the Auxiliary will be held on Thursday and Friday mornings.

As in former years, there will be a golf tournament. This year it will be played on the beautiful eighteen-hole course of the Eugene Country Club, recognized as one of the finest in the West. Other features of the meeting will be the breakfast meetings of the House of Delegates on Thursday, Friday and Saturday mornings, the business meeting and election of officers on Saturday morning, and the annual banquet Friday evening. Saturday night the session will be brought to a close by a lively stunt dinner, when golf prizes will be awarded. After this doctors may see the freshmen of Oregon's two rival institutions of higher learning battle on the gridiron at a game to be played under arc lights at Hayward Field.

For a number of years the State Society has aimed to develop writing and speaking ability of its members with the special purpose of stimulating the younger men to work up material obtained in the course of practice to be presented in the form of papers. In order to stimulate interest the Council offers five prizes of $25.00 each for the best papers submitted in surgery, internal medicine, obstetrics and gynecology, and ophthalmology-otology-laryngology-rhinology. These papers will be judged by the Scientific Committee on the basis of originality, clinical matter and applicability of material to general practice, and prizes awarded accordingly. Thirty-four papers have been submitted in this contest and from them will be selected a suitable number for the program of this annual meeting. These will be listed in next month's issue when the complete program will be published.

The guest speakers will present the following papers.

"Clinical Amebiasis and Newer Methods of Treatment." Alfred C. Reed, Professor of Tropical Medicine, University of California Medical School, San Francisco.

"Recent Discoveries in Endocrinology and Their Clinical Applications." Hans Lisser, Associate Clinical Professor of Medicine, University of California Medical School, San Francisco.

"Some Phases of Preventive Psychiatry." Henry H. Dixon, Colorado Psychopathic Hospital, Denver; newly appointed Associate Clinical Professor of Neuropsychiatry, University of Oregon Medical School, Portland.

"Conservatism in Gallbladder Surgery. J. Tate Mason, Department of Surgery, Mason Clinic, Seattle, Wash.

The following order of procedure will be observed for each day's program which will be presented at the Chamber of Commerce Building.

THURSDAY, OCTOBER 22

Morning: Registration of delegates and members. President's Address: Thomas E. Griffith, The Dalles. Scientific Session. Business meeting of Women's Auxiliary.

Afternoon: Scientific Session. Fourth Annual Oregon Medical Golf Tournament.

Evening: Public educational meeting. Speaker, Dr. Alfred C. Reed, Professor of Tropical Medicine, University of California Medical School, San Francisco; Subject: "Health Lessons from the Orient." Motion Picture: "Many Happy Returns" (urging periodic health examinations).

FRIDAY, OCTOBER 23

Morning: Breakfast meeting of House of Delegates. Scientific Session. Business meeting of Woman's Auxiliary.

Noon: Annual luncheon. Meeting of Oregon Public Health League. Speaker, Senator J. C. Booth, Lebanon. Subject, "The Basic Science Act."

Afternoon: Scientific Session.

Evening: Annual banquet. Annual complimentary dinner to Woman's Auxiliary.

SATURDAY, OCTOBER 24

Morning: Breakfast meeting of House of Delegates. Business session and election of officers. Scientific Session.

Afternoon: Scientific Session.

Evening: Stunt dinner. Awarding of golf prizes. Night football game. University of Oregon "Frosh" vs. Oregon State College "Rooks."

MEDICAL NOTES

OREGON

Meeting of Eastern Oregon Medical Society. On August 1 at Wallowa Lake, the medical men of Eastern Oregon held their annual meeting. The program was as follows: "Predisposing Causes of Nasal Sinus Infection," Dr. Lee B. Bouvy; "Comedo Carcinoma of the Breast," Dr. F. C. Hill; "Spinal Anesthesia," Dr. Mark T. Phy; "Elbow Fractures in Children," Dr. Richard B. Dillehunt; "Diagnosis and Treatment of Painful Abdominal Conditions other than Organic Disease," Dr. Robert C. Coffey; "The Practical Application of Quantitative Diets as Applied to Obesity, Diabetes, Epilepsy and Cardiorenal Disease," Dr. Blair Holcomb; "Review of Cesarean Section in Portland in Three Years," Dr. T. W. Adams; "Some of the Problems of Cholecystitis," Dr. J. Tate Mason; "The Successful Treatment of Tic Douloureux with the Injection of Alcohol," Dr. J. Earl Else; "Relationship of the Profession to Modern Industrial Accident System," Dr. Andrew C. Smith.

The following officers were elected for the ensuing year: President, Dr. C. C. Gordon, Baker; Vice-president, Dr. Thos J. Higgins, Baker; Secretary-treasurer, Dr. James J. D. Hann, La Grande. Delegates to Oregon State Society meeting of 1932, Dr. A. D. McMurdo, Heppner, and Dr. Lena Wilkes, La Grande.

Dr. Wm. P. Murphy, coworker with Dr. Minot on the treatment of pernicious anemia with liver and liver extract, was a visitor last month with his parents at their home in Portland. He is a graduate of the University of Oregon Medical School, and from there went to his work at the Harvard Medical School and Peter Bent Brigham Hospital at Boston, Mass. Recently, Drs. Murphy and Minot have received the Cameron award, presented by the University of Edinburgh, for scientific research in the field of medicine for 1931. This award carries a stipend of $1,000 and a lectureship at the University of Edinburgh.

Cancer-mindedness Developed. The interests of the laity and of the medical profession are both well served by such meetings as those arranged by the Union County Health Association of La Grande. The film, "The Great Peril," produced under the auspices of the American Society for the Control of Cancer, was shown through the courtesy of Dr. A. D. Murdo of Heppner, president of the Eastern Oregon Medical Society. Speakers at this free, public meeting were Drs. R. C. Coffey, J. Earl Else and Frederick Striker of Portland.

New Hospital to be Erected. Under the name of the Clarke General Hospital, a new $150,000 building will be erected on the site of the East Side Clinic, East 6th and Pacific Streets, Portland. It will be of concrete with three floors above ground.

New County Physicians Appointed. Dr. J. O. Robb, for several years Washington County physician, has resigned from that office. In his stead the court has appointed Drs. G. F. Via of Forest Grove and H. O. Pitman of Hillsboro.

WASHINGTON

July Examinations for Licenses. On July 9 and 10, the Basic Science examination was held at Seattle. Fifty-five applicants appeared, of whom forty-seven passed and eight failed. There were forty-four medical doctors with two failures, six osteopaths with two failures and four chiropractors with three failures. One drugless physician failed. At the medical examination, held July 13 and 14, there were twenty applicants, all of whom passed and received licenses. Eighteen others, who passed the Basic Science examination, received reciprocity licenses, making thirty-eight physicians licensed at this meeting. Two applicants took the examination in surgery in connection with osteopathy and surgery, both of whom were successful and were granted licenses in this branch of practice. One applicant, who passed the Basic Science examination, was licensed to practice osteopathy through reciprocity.

Marine Hospital. With the low bid of $1,269,090, A. N. Severin of Chicago has taken over the work of erecting the Federal Marine Hospital on Beacon Hill in Seattle. Work has started and is progressing rapidly. The building will be of steel and concrete, with stone and terra cotta trim, covering a ground area of 135 by 256 feet, to be a thirteen-story building, with tower running up to sixteen stories. The statement goes with the announcement that all possible materials and supplies are being furnished from this section of the Northwest.

Alcoholic License is not Popular. A check of the records at the offices of different county auditors reveals that few doctors and dentists are availing themselves of the newly acquired privilege to buy alcohol for professional purposes; this in spite of the rather current belief that the demand for alcohol among doctors and dentists is at a comparatively high level.

Golfing Honors to Yakima Doctors. The golf title of the Washington State Medical Association at the Aberdeen tournament went to Dr. J. P. Loudon of Yakima for the fifth successive year. In the best ball match Drs. J. A. Bline, E. S. West, L. L. Lugar and Loudon won the county team contest.

Change of Locations. Dr. J. W. Malzacher, graduate of the University of Nebraska and recent resident physician of Columbus Hospital in Seattle, has located at Twisp. He replaces Dr. W. E. Gossett who is leaving on an extended trip.

Returns from European Clinics. Dr. George Dix has recently returned to Marshfield after a three months postgraduate course in England and Germany.

Dr. George H. Houck of Roseburg has recently left for California, where he is to be associated in the practice of medicine with Dr. E. Stanley Grainger of Los Angeles.

Takes Over Practice. Dr. Donald Hughes of La Grande, Oregon, has taken over the practice of Dr. Carrie Freeman of Boise, who has gone to Los Angeles.

Dr. H. H. Coleman, graduate of the University of Virginia, has opened offices in the Medical Building in Mt. Vernon.

New Physician for Olympia. Dr. L. W. Gregory, graduate of the Universities of Wisconsin and California, has decided to locate in Olympia. He has recently completed a residency in the Shriners Hospital in Philadelphia and has done postgraduate work in London and Vienna.

Dr. J. Walton Darrough has opened offices in Monroe. He has recently served an internship at St. Vincent's Hospital, Portland, Ore. He is a graduate of Oklahoma University School of Medicine.

Dr. Franklin M. Gage of Shelton has gone east to take postgraduate study at Johns Hopkins University.

Dr. H. J. Holte announces opening of offices in Elma, in association with Dr. A. A. Foote.

IDAHO

New Hospital at Blackfoot. Two modern ward buildings will be constructed at the State Hospital at Blackfoot at an approximate cost of $230,000. Construction is scheduled to begin September 1. In addition to this there will be a remodeling of the heating system at a cost of $20,000. Each ward building will be a three-story structure of reinforced concrete. Ultimate plans call for the building of eight or ten ward buildings of this character to care for patients of different medical classifications.

Dr. J. F. Gist announces the opening of offices in Lewiston for practice in diseases of the eye, ear, nose and throat. He has just returned from a year's trip in Europe, where he took postgraduate work in his specialty.

Dr. A. B. Halliday is locating in Lewiston and will be associated in his office with Dr. Paul G. Haury.

OBITUARIES

Dr. Walter C. Lippincott of Seattle, Wash., died in Los Angeles, Calif., June 25, aged 57 years. He was on a visit to his daughter and was in his usual health on retiring, but died during the night of disease of the heart. He was born in New Jersey, November 5, 1874, the son of a clergyman. In 1896 he received the Bachelor of Arts degree from the University of Pennsylvania, and in 1898 that of Master of Arts. He obtained his medical degree from the same university in 1903. For two years he served as intern in the Methodist Hospital of Philadelphia. In 1905 he located in Seattle, and served a year as intern at Seattle General Hospital. Until the time of his death he was in active practice and keenly interested in many affairs of the city. He devoted much time to the interests of Seattle General Hospital, of which he was superintendent at the time of his death. He was also much interested in the Children's Orthopedic Hospital, and for a number of years was a member of its surgical staff. He was an unusual Latin and Greek scholar, as well as a musician of ability. He had the affection of a large clientele, and was held in high esteem and deep regard by the whole medical profession of the city.

Dr. Philip B. Swearingen, of Tacoma, Wash., died August 12, aged 69, following a cerebral hemorrhage. He was born in Van Buren, Ark., in 1862. After preliminary schooling in his home town he graduated from Washington University Medical School, St. Louis, in 1887. He practiced in Van Buren until 1892, when he located in Tacoma, where he was in charge of Puyallup Indian School. In 1895 he became surgeon to Northern Pacific Railroad Co. For many years he has been a well known practitioner and for ten years has been on the medical staff of Tacoma General Hospital. He was held in high esteem by the people of the city as well as the medical profession.

Dr. J. W. MacLachlan of Seattle, Wash., died August 1, aged 68 years. He was born in Ontario, Can., in 1863. He received his medical degree from the University of Michigan in 1886. Sometime after graduation he served as intern at Ward's Island Hospital, New York City. Later he went to Europe, where he made a special study for eye, ear, nose and throat practice. He practiced in Michigan, Chicago and Dayton, Wash., before locating in Seattle in 1903. He retired from practice two years ago. While a man of retiring disposition, he was held in fond esteem by his patients and others who were privileged to have his acquaintance.

Dr. Elmer E. Lytte of Bothell, Wash., died August 17, aged 70 years. He was born near Carrollton, Ohio, in 1861. He obtained his medical degree from Rush Medical College in 1887. For a time he practiced in Missouri, being associated with the late Dr. John A. McKinnon who later was a well known practitioner of Seattle. He came to Washington in 1890 and located for practice at Bothell in 1896. He was well and favorably known over a wide extent of territory about that city, belonging to the old type of general practitioner who was the recognized family physician.

Dr. J. E. Taylor, age 59, died at his home in Redding, California, Sunday evening, August 2. He was a graduate of the University of California. From 1908 until 1913, he practiced in Klamath Falls, Oregon, and will be remembered by pioneer residents of that city and county.

Dr. Will H. Payne, of Yakima, Wash., age 57, died en route to the hospital on August 1. He had been in ill health for several months and apparently died of coronary embolism. He was born in Ivanhoe, Ill., and was a graduate of the Northwestern University Medical School of Chicago. He served throughout the period of the late war and for a short time afterwards practiced in Oklahoma before returning to his residence in Yakima.

Dr. John C. Ross age 61, died at his home in Beverly Hills, Calif., on August 7. He was a prominent resident of Cathlamet, Wash., prior to his moving to California. He was a graduate of the University of Oregon Medical School and had retired from active practice of medicine at the time of his death.

Dr. Benjamin A. Cathey, age 77, of Portland, Ore., died August 18 at his residence. He was a graduate of the old Portland high school and Albany College and taught at Brownsville and Roseburg before taking up the study of medicine. He was a graduate in medicine of Willamette University and was for years on the University faculty.

Mutiple Myeoma and Diabetes Insipidus. Mark J. Bach, Milwaukee, and William S. Middleton, Madison, Wis. (*Journal A. M. A.*, Aug. 1, 1931), report an instance of the coincidence of gross pathologic changes in the bones and diabetes insipidus. Of particular significance were the possible changes in bony structures about the sella. Whatever the interrelationship between the bony lesions and the disturbance in water metabolism, a further example is added in the case of multiple myelioma with associated diabetes insipidus.

REPORTS OF SOCIETY MEETINGS

WASHINGTON STATE MEDICAL ASSOCIATION

MINUTES OF THE FORTY-SECOND ANNUAL MEETING OF WASHINGTON STATE MEDICAL ASSOCIATION, HELD AT MORCK HOTEL, ABERDEEN, WASH., AUG. 3-5, 1931

The forty-second annual meeting of Washington State Medical Association was held at Morck Hotel, Aberdeen, Wash., Aug. 3-5, 1931.

HOUSE OF DELEGATES

First Session

Tuesday, August 4

The meeting was called to order by the President, Dr. Arvid E. Anderson. On calling the roll, the following were present: H. E. Cleveland, A. E. Anderson, J. T. Rooks, C. H. Thomson, J. H. O'Shea, D. H. Houston, S. L. Caldbick, H. J. Whitacre, George Anderson, Elmer Hill, Carroll Smith, P. J. Gallagher, C. J. Johannesson, W. B. Penney, A. G. Young, D. E. McGillivray, R. D. Wiswall, J. W. Henderson, H. G. Miller, H. E. Coe, A. H. Peacock, C. E. Watts, O. A. Nelson, A. T. Wannamaker, A. O. Loe, Fred Slyfield, W. C. Speidel, F. J. Clancy, Roger Anderson, O. S. Proctor, Rush Banks, F. W. Anderson, H. G. Willard, W. D. Read, D. M. Dayton, E. C. Leach, C. L. Hoeffler, H. E. Rhodehamel, S. S. Oppenheimer, S. E. Lambert, R. J. Sprowl, E. J. Rhoades, J. R. Morrison, E. N. Layton, F. H. Brush, Kay England.

President's Address

Dr. A. E. Anderson

After serving one short year as the President of our State Medical Association, I have made contacts and I hope friendships that will be everlasting. It has indeed been a great pleasure to serve you and to know all of you better than ever before.

I have taken note of a number of things regarding our State Association that I hope, in transmitting to you, may be of value to you and your Association as a whole.

It is needless to comment on the unfailing loyalty of our Secretary, Dr. C. H. Thomson. Despite painful physical adversities he was always ready to cheerfully impart any information requested of him, to do all in his power to assist the president, and always worked for the welfare of our organization. Too much credit cannot be given our faithful secretary for his work during the past year.

As a component part of our parent association, the American Medical Association, we as a society should endorse at this annual meeting some of the resolutions offered at the meeting in Philadelphia.

The Michigan State Society presented a resolution in regard to filling out claim proofs of health and accident insurance for insurance companies. As you all know, you are called upon very frequently to fill out blanks, which sometimes takes up a considerable amount of your time, without any remuneration. It is suggested that a minimum fee of $2.00 be paid by the insurance company seeking this information, thus obviating the attempt to collect from the claimant.

I also believe that we as a society should endorse the resolution on the policy of rendering medical and hospital benefits to war veterans with nonservice connected disabilities. There is no question but that the federal government is entering into an unjust competition with civilian hospitals and the medical profession of the entire nation. We hope that a solution may be worked out and a plan made which will be acceptable to Congress and to the legislative program of the American Legion.

At present an effort is being made for a new building for our parent organization. The cramped headquarters in Chicago is very noticeable to any visitor. A building fund is started and it is hoped the trustees will soon find a way to start a new building so as to relieve the present congestion and obviate the necessity of renting space for storage of our valuable archives. I hope that our society will endorse the efforts of the Trustees of the American Medical Association in this endeavor.

Within the last four months I have received communications in regard to the formation of a Women's Auxiliary. At present there are 13,000 paid members in thirty-seven states (organized). It is evident from the report of Mrs. J. Newton Hunsberger, president of the Women's Auxiliary, that this organization has a place with our state societies, and it is further evident that the state of Washington will have to fall in line and have an auxiliary. I believe at this time that our House of Delegates should consider this problem, so as to relieve our incoming President and our Secretary of a large amount of correspondence.

For a number of years we have heard a great deal about a grievance committee. The state of New York has an ideal plan incorporated in their medical practice law. I have given a great deal of thought and study to their plan but do not see how we can follow it unless we change our present Administrative Code. It is feasible to develop a grievance committee within our State Medical Association and with the cooperation of our Department of Licenses review all cases and present a citation to the Board of Medical Examiners for their action. We as a medical body in this state are entitled to have medical men review all cases of misconduct among our profession, as well as the State Bar Association reviews misconduct among its members. At the present time our medical practice act, which is a part of the Administrative Code of 1921, clearly sets forth in sections 10014-15-16 and 17 of Remington's Compiled Statutes, the procedure necessary in unprofessional conduct, revocation of license, etc. The only hope for a grievance committee in this state is to have one within our State Association that will function with our State Board or to change our medical practice act so as to include one planned after the medical practice act of the State of New York.

At our last annual meeting the House of Delegates voted to have the trustees of our State Association hold quarterly meetings. Apparently this plan is not feasible, because many times there is not enough business to attend to, and, therefore, these meetings should be held at the discretion of the president or secretary. There must also be considered the expense in connection with such a meeting, costing approximately $250.00. I hope, therefore, that the House of Delegates at this meeting will rescind their previous action and allow the president or secretary to hold the meetings of the trustees, when in their opinion the stress of business warrants such action.

I wish to express my appreciation to our trustees and committees and their respective chairmen. Especial appreciation is accorded the cancer, social hygiene, tuberculosis, hospital survey, and golf committees and a great deal of credit is due their respective chairmen for their excellent work. I believe we should have another committee, entitled "The Scientific Service Committee." Such a committee, planned after the one in the state of Illinois, would list speakers and their subjects for both medical society and lay meetings.

Our Public Health League has functioned in this respect for lay meetings, but could not take care of our medical societies. If this suggestion is favorable. I hope that such a committee may be established for the coming year.

Especial appreciation is accorded our Public Health League for its work the past year. A great deal of credit is due the president and secretary for their unfailing loyalty and their efforts to assist the medical profession of this state by their work at Olympia during the recent session of our State Legislature.

At this time I wish to express my appreciation and thanks to the local committees and the ladies of the Grays Harbor County Medical Society for their endeavors to make this meeting a success. We hope you will enjoy yourself and take home pleasant memories of Grays Harbor. We also hope our scientific program will be one of interest and great value to you.

In closing, let me assure you of my deep appreciation of the confidence and trust you have had in me for the past year. If you will forgive any transgressions and think kindly of any good I may have done my memories of this past year will forever be happy.

Dr. P. J. Gallagher moved that the President's address and all other resolutions that might come up before this House be referred to a Resolutions Committee. Motion was adopted.

Secretary-Treasurer's Report

To the Officers and Members,
Washington State Medical Association,
Seattle, Washington.
Gentlemen:

In accordance with your request, we have examined the books of the Washington State Medical Association, for the six months ending June 30, 1931, and as a result of our examination we have prepared and attach herewith the following Exhibits:

Medical Association Fund, Exhibit "A."
Medical Association Fund, Disbursements, Exhibit "B."
Legal Defense Fund, Exhibit "C."
Legal Defense Funds, Disbursements, Exhibit "D."

While it has been our aim to make these exhibits self-explanatory, we might offer the following comments.

MEDICAL ASSOCIATION FUND

Receipts from membership dues for the period have amounted to $4,650.00, being remittances from 930 members; 812 of these were for 1931, 93 for 1930, and 7 for 1929. These amounts were satisfactorily reconciled with the remittance blanks of the Secretary-treasurers of the various constituent societies. We have also credited this fund with interest on the account with the Washington Mutual Savings Bank, $131.11, making a total in receipts of $4,781.11.

Disbursements have amounted to $3,847.32, as shown by Exhibit "B." Therefore, showing an increase in this Fund of $933.70. This amount, added to your January 1 balance of $6,193.08, gives you a balance of $7,126.87 to the credit of this Fund at June 30, 1931, as shown by Exhibit "A." This balance is made up by cash $10.00, Metropolitan National Banks, $2,116.87, Washington Mutual Savings Bank, $5,000.00

LEGAL DEFENSE FUND

Receipts from subscribers to this Fund have amounted to $2,650.00, interest $305.00, or total receipts of $2,955.00. Disbursments for the period have amounted to $410.86, as shown by Exhibit "D," a net increase of receipts over disbursements of $2,544.14. This amount, added to your January 1 balance of $21,814.75, gives you a balance of $24,358.89 to the credit of this Fund at June 30, 1931, as shown by Exhibit "C." This amount is made up of balance Metropolitan National Bank, $6,496.29, and securities as per list attached, amounting to $17,862.60.

GENERAL

The bank balances have been satisfactorily reconciled with statements from the depositories. The bonds were inspected by us, and were found to be intact with all unpaid coupons attached.

All disbursements have been made by voucher check, drawn on your regular depository, have been properly endorsed and cleared through the banks in regular order. Invoices from parties to whom payments were made are properly O. K.'d by the President of the Association and are on file, or payments authorized by your minutes or By-Laws.

Remittances of subscription to Northwest Medicine have not been made on nineteen members. This has been taken up with your Secretary-treasurer and will be done immediately.

CERTIFICATION

WE HEREBY CERTIFY that the attached Exhibits, together with the foregoing comments, are in agreement with your books, and in our opinion are correct, and show the true status of the two funds at June 30, 1931, and the correct amount of receipts and disbursements for the six months ending that date.

Respectfully submitted,
LOUIS E. SMITH & CO., C.P.A.
(Signed) By LOUIS E. SMITH.

Motion moved and seconded that the report be accepted and placed on file.

Motion was made and adopted that the minutes of the last meeting be accepted as published in Northwest Medicine.

The Secretary then read the list of deceased members. This report was turned over to the Resolutions Committee.

Deceased Members

Dr. Frank P. Gardner, Seattle, 1869-1930; Western, 1896.

Dr. John Patrick Sweeney, Seattle, 1858-1930; Columbia, 1882.

Dr. Ralph F. Goetter, Colville, 1890-1930; St. Louis, 1915.

Dr. Ernst Flehme, Spokane, 1891-1930; Univ. of Kiel, 1914.

Dr. Chas. W. Davis, Seattle, 1860-1931; Missouri Med. College, 1884.

Dr. Ernest C. Wheeler, Tacoma, 1872-1931; Rush, 1899.

Dr. Cora Turner Saxe, Seattle, 1859-1931; Valparaiso, 1886.

Dr. E. C. Neville, Seattle, 1866-1931; Fort Wayne, 1889.

Dr. G. L. Closson, Seattle, 1874-1931; U. of Vermont, 1904.

Dr. W. O. Dutton, The Dalles, 1862-1931; Jefferson, 1889.

Dr. J. W. Wilkins, Seattle, 1870-1931; Medico-Chirurgical College, 1896.

Dr. Walter C. Lippincott, Seattle, 1874-1931; Univ. of Penn., 1903.

Dr. George W. Hoxsey, Wenatchee, 1860-1931; Natl. Univ., St. Louis, 1889.

President Anderson then appointed the following as the Resolutions Committee: Dr. J. H. O'Shea, Chairman, Dr. O. R. Austin, Dr. H. J. Whitacre, Dr. F. H. Brush, Dr. Frederick Slyfield.

President Anderson presented the following communications from the American Medical Association, which were referred to the Resolutions Committee.

Abuse of Narcotic Drugs

October 31, 1930.

Dr. C. H. Thomson, Secretary,
Washington State Medical Assn.,
1305 Fourth Avenue,
Seattle, Wash.

Dear Doctor Thomson:

With the approval of the Board of Trustees of the American Medical Association, I write to urge the active cooperation of the Washington State Medical Association with the Federal Commissioner of Narcotics and the proper officers of your own state in their efforts to suppress the abuse of narcotic drugs.

It was solely through the efforts of the American Medical Association that Congress recently authorized the cooperation between the Federal Government and the governments of the several states, by providing:

"That the Secretary of the Treasury shall cooperate with the several states in the suppression of the abuse of narcotic drugs in their respective jurisdictions, and to that end he is authorized (1) to cooperate in the drafting of such legislation as may be needed, if any, to effect the end named; and (2) to arrange for the exchange of information concerning the use and abuse of narcotic drugs in said states and for cooperation in the institution and prosecution of cases in the courts of the United States and before the licensing boards and courts of the several states. The Secretary of the Treasury is hereby authorized to make such regulations as may be necessary to carry this section into effect." An Act to create in the Treasury Department a Bureau of Narcotics, and for other purposes, approved June 14, 1930, Section 8.

The influence of the Washington State Medical Association in promoting the establishment of effective cooperation as contemplated by the act will go a long way, it is believed, toward determining whether the legislation that the American Medical Association proposed and sponsored will or will not be successful.

Yours truly,
(Signed) Wm. C. Woodward, Director,
Bureau of Legal Medicine & Legislation.

Criminologic Institutes

July 11, 1931.

Dr. C. H. Thomson, Secy.,
Washington State Medical Ass'n,
1305 Fourth Ave.,
Seattle, Wash.

Dear Doctor Thomson:

The establishment of a criminologic institute in each state not already provided with such an agency for the detection and punishment of crime was recommended by the Committee on Medicolegal Problems of the American Medical Association, to the Board of Trustees, at a meeting of the board held in Philadelphia, June 7, 1931. The Board of Trustees approved this recommendation. I enclose herewith an extract from the committee's report showing why criminologic institutes should be established throughout the country.

This matter is brought to your attention in the hope that the Washington State Medical Association will take action at its approaching meeting in support of this movement and endeavor to bring about the establishment of a medicolegal institute in the State of Washington. How such an institute can be best fitted into the general governmental organization of any state is a matter that will have to be worked out locally, but the advisability of affiliating it with the state university so as to utilize all of the already existing resources in that field and to provide an adequate method for the instruction of peace officers throughout the state seems worthy of consideration. If the Washington State Medical Association approves of the suggested establishment of a criminologic institute for the state and refers the matter to an appropriate committee with power to work out details and authority to act, everything will be accomplished that is at present practicable.

If the Bureau of Legal Medicine and Legislation or the Committee of Medicolegal Problems can be of service to you in connection with any movement toward the end named, please let me know. The committee consists of Dr. H. Douglas Singer of Chicago, Dr. Winfred Overholser of Boston, Dr. William C. Woodward of Chicago, Dr. Ludvig Hektoen of Chicago, and Dr. William J. Stapleton, Jr., of Detroit.

Yours truly,
Wm. C. Woodward,
Director.

Report of Committee on Medicolegal Problems

American Medical Association

To the Board of Trustees:

CRIMINOLOGIC INSTITUTES

The detection and punishment of crime is a major problem today throughout the entire country. Experience abroad and a limited experience in the United States have shown that science can do much to aid in accomplishing these ends. Frequently the first step in the detection of crime, the identification of the living and the dead—sometimes the identification of mutilated portions of dismembered bodies—depends on anthropometric measurements, fingerprints, evidences of age, sex, race, preexisting diseases, and old injuries, such evidence as is discoverable only by skilled pathologists. Examination of the dead body, by inspection and autopsy to determine the cause and time of death, call for like services. The nature and origin of stains must be accurately determined, procedures that call for scientific technic and accuracy. Vomitus, excreta and the contents of the intestinal tract, the various tissues and organs of the body, and various substances found in and about the place of death must be analyzed to determine the presence or absence of poisons, the nature of food and drink ingested by the deceased or the accused, and so on. Inquiries must be made into the mental states of persons from whom complaints are received and of persons under arrest or on trial, whether those mental states be due to narcotic drugs, alcohol, injuries, disease, congenital defects or insanity. Scientific investigations are necessary in connection with charges of criminal abortion, rape and infanticide. On the borderline of medicine, studies must be made to determine what relations there are, if any, between a given projectile, powder stain, powder residue, cartridge case and weapon, and a given wound. Somewhat farther afield are studies of disputed documents, of foot-prints, the tracks left by vehicles, impressions of jimmies, and marks left by the use of oxy-acetylene torches and explosives in connection with safe-cracking.

The character and extent of the equipment necessary for the several purposes named in the preceding paragraph, and the character and extent of the knowledge and skill necessary for the practical utilization of that equipment in the everyday detection of crime and the punishment of criminals are such as now preclude their utilization by the average community. Only the States themselves and in a few instances the larger cities within the States are able to finance such activities. Moreover, in communities of average size or below, occasions for the utilization of many of the devices necessary for the purposes named and for the services of persons skilled in the use of those devices are so infrequent as to make the cost of operation unduly great, when compared with the units of work done.

The only logical procedure seems to be for each of the several States to provide and maintain the equipment necessary for the service of all communities within its borders. The establishment of such agencies by the several States would in no way interfere with the establishment of similar agencies by such municipalities as need and can afford them. On the other hand, equipment and staff maintained by the State would be at the command of all counties, municipalities, towns and villages within its jurisdiction, as they might need them from time to time. The cost of such activities might well be borne by the State. If, however, the State should deem it advisable to impose a part of that cost on counties, municipalities, towns and villages, a definite schedule of charges might well be established.

Such a State organization as has been outlined above would serve not only to aid directly in the detection and punishment of crime but also to serve indirectly toward that end by contributing toward the proper instruction of the peace officers and agents of the State, and every county, municipality, town and village, in methods for the investigation of crimes and suspected crimes. Such officers and agents could be taught how best to collect and preserve such evidence as the circumstances afford and how to avoid destroying or marring essential evidence. State agencies of the type named might well have connected with them experts qualified to keep accurate records of crime and crime prevention, so as to measure the success or failure of activities for those ends.

Organizations such as have been described have been variously dubbed medicolegal institutes, criminologic institutes, and scientific crime detection laboratories. The name seems hardly material, although the name last stated is hardly broad enough to cover the true functions of such organizations.

It seems to your committee that action to promote the establishment of such organizations in each of the several States would be in the interest of good government. Your committee recommends, therefore, that it be authorized to take action toward that end, working in conjunction with and through the Bureau of Legal Medicine and Legislation.

H. Douglas Singer
Winifred Overholser
William C. Woodward
Ludvig Hektoen
William J. Stapleton, Jr.

Dr. H. E. Coe then gave a brief resume of the activities of the Hospital Standardization Committee; likewise Dr. H. J. Whitacre covered the work of the Cancer Committee.

Dr. W. R. Jones read the following

Social Hygiene Committee Report

This committee has during the past year continued to confine its efforts to educational work, keeping out of everything that might be controversial. This has necessarily limited our activities.

We have acted as a clearing house of social hygiene information, furnishing same to organizations only such as would meet the approval of this association. This year there has been an unusually large number of organizations and individuals seeking what we had to offer to be used for their selfish motives. Two instances might be cited as illustrative.

A patent medicine company under a high sounding name asked copies of some pictures and statistics we had, to be used in, so they said, "educational work."

Another instance was when a community club asked for some venereal disease information and a copy of some statistics. Reason given was they wished to call attention of the authorities to the possibility of improving conditions in their part of town. A little investigation before acceding resulted in finding that the instigator wishing to improve the community, really wanted to eliminate a certain graft collector that he himself could have the rake-off. While this present reformer had been doing his time in the penitentiary, an "imposter had muscled in."

We sat in on several meetings of a group interested in forming a Washington Social Hygiene Society. The only obstacle this lay committee encountered has been lack of finances. The right kind of people are behind this movement and some kind of organization will come. The group has the support of the health departments of the state and cities, and American Social Hygiene Association. Physicians are not very strongly represented in the movement. The group purposely leaves out the doctors and preachers to keep it from appearing a quasi-medical or moral movement.

This committee has, through the Public Health League, Washington State Department of Health, City Department of Health of several larger cities, the Y. M. C. A., the Y. W. C. A. and other organizations, furnished canned lectures on subjects related to social hygiene. We have furnished the schools with canned lectures illustrated with lantern slides, covering the subjects of normal physiology and bacteriology.

Social hygiene information concerning sex function cannot be given the public schools because of a ruling of one of the churches prohibiting giving of information regarding the sexual apparatus to the adolescent. They say this is the province of the parent to impart sex information, none other.

We have, assisted by Dr. Weinzirl of the Seattle Department of Health, collected a considerable amount of social hygiene information which you will find in our exhibit here. Dr. Weinzirl is responsible for the making of the placards. The rest of us collected the material from information we had on file or access to. This exhibit was shown at the A. M. A. meeting in Philadelphia this year, as a part of the American Social Hygiene Association's industrial exhibit.

If you will study the exhibit closely, you will notice that sex delinquencies can most all be traced to having their start because of home life upsets. Social hygiene concerns with everything having to do with the preservation of the home. Sex comes in to claim considerable attention merely because of the home being founded on the union of the sexes.

At present most everything seems to be tending for home disruption. Everything modern tends to take people away from the home with two exceptions, the stork and radio. The best we can do is to emphasize that social hygiene is not sexology, but a broad thing, having for its ultimate purpose fostering of everything for preserving the home institution and antagonistic to everything tending to its disruption.

Dr. Frederick Slyfield presented the

Tuberculosis Committee Report

The work of the tuberculosis committee this year consisted in an educational program, dealing with the protection of the child from tuberculous infection. This field was chosen because it is in line with the work of the National Tuberculosis Association which has stressed this particular point during the ensuing year. Our work was done in cooperation with the Public Health League, with the Washington Tuberculosis Association, and the rest of it privately. Talks were given at service clubs in several parts of the state, in high schools, at Parent-Teacher Association meetings, over the radio, at meetings of County Tuberculosis Leagues, and even at the colored Y. W. C. A.

It is felt that a lot of good has been accomplished and the plan is recommended to other committees.

Miss Helen Wilcox of the Public Health League was granted the privilege of the floor, and addressed the House of Delegates as follows:

Report of Public Health League

I am making this report on behalf of the Public Health League, the League being officially the Legislative Committee of the State Medical Association.

The Washington State Medical Association referred to the League its resolution viewing with disapproval the solicitation of patients or groups of patients. Informal meetings were held by the officers of the Public Health League, among whom are several members of the Board of Trustees of the Medical Association, and the various phases of contract practice were fully discussed. It was finally decided that the League should seek means of remedying, first, solicitation of contracts by hired solicitors; and, second, contracts entered into by physicians who because of distance could not give their personal supervision to the employees covered by the contract, known as "remote control" contracts. These decisions were discussed with Dr. A. Macrae Smith, President of the Association of Industrial Physicians, and he stated his approval of the principles.

A conference was arranged with Mr. John Dunbar, prosecuting attorney of the State of Washington, who is thoroughly conversant with the Medical Aid Law of this State. At this conference there were Dr. W. J. Taylor, senator from Clallam County, Mr. Dunbar, one of his assistants, and myself. After canvassing the situation, it was Mr. Dunbar's opinion that the desired objects could scarcely be accomplished by legal enactments, since any law prohibiting solicitation of contracts could so easily be evaded. Mr. Dunbar suggested that a more desirable method of regulation could originate in the Medical Association and that the legislature should not be asked to pass unenforcible statutes.

Regarding the remote control plan, Mr. Dunbar pointed out that the Medical Aid Law specifically gives to the Director of the Department of Labor and Industries the right to disapprove any contract for medical services and that a departmental ruling was all that was necessary to control this abuse.

This advice was submitted to our executive committee and was by the committee accepted. For further information regarding legislative matters I invite you to attend the League luncheon to be held today.

Resolutions

Dr. Oscar Proctor offered the following resolution:

WHEREAS: The delegates from the Washington State Medical Association to the A. M. A. are elected for the purpose of representing the state organization and obtaining information of value to the state organization and WHEREAS: The proper performance of their duties requires their absence from their practices often to their personal and professional disadvantage; therefore, be it

RESOLVED, That the Secretary-Treasurer of the State Medical Association be and hereby is authorized to pay to each delegate a sum not to exceed $200 toward defraying his expenses to such meeting.

The Secretary offered a substitute motion that the delegates be granted their actual expenses, including railway fare, pullman fare, hotel room, and five dollars per diem. The motion and substitute motion were referred to the Resolutions Committee.

Dr. C. L. Hoeffler presented the following resolution:

We hereby move that a committee of seven men from among the members of the Washington State Medical Association be nominated and elected by the House of Delegates at this session. This committee shall be known as the Initiative Committee. The duties of this committee will be to originate and perfect an initiative bill and make all the necessary preparations for its successful passage at the fall election in 1932.

The chief purpose of the committee's Initiative Bill will be to strictly and actually enforce the just principle that each individual workman must choose his own personal physician.

The origination and passage of this Initiative Bill will entail extensive clerical work and legal advice, so we wish to include in this motion that the Secretary-Treasurer be authorized as expanded to forward to this committee a sum of money the total of which shall not exceed $2,500.

This resolution was referred to the Resolutions Committee.

Dr. O. A. Nelson presented the following resolution:

WHEREAS: The Medical Practice Act of the State of New York embraces a Grievance Committee plan and has been in operation for about four years, and

WHEREAS: Physicians of that State are reported to be well satisfied with the results of the plan, and

WHEREAS: The matter of adapting the plan to this State has been under consideration by your committee and the committee finds that the practice acts of the various healing arts must be revised and other legislation enacted before the plan can be successfully put into operation in the State of Washington; therefore, be it

RESOLVED: That a committee of three be appointed by the President of the Washington State Medical Association to make a study of the changes that will be necessary in our present laws in order to make possible the operation of the plan, said committee to consist of one officer of the W. S. M. A., one officer of the Public Health League and one other physician to be chosen by them, and further,

That the committee so appointed be requested to meet within sixty days to outline its program and that it be instructed to report its recommendations at the 1932 annual meeting of the Washington State Medical Association.

This resolution was referred to the Resolutions Committee.

Dr. A. O. Loe presented the following resolution:

WHEREAS: The Medical Fee Schedule of the Workmen's Compensation Act in the State of Washington is in part lower than other States of the Union, and

WHEREAS: After an exhaustive study of all the fee schedules in the United States and foreign countries, a standard fee schedule has been presented to King County Medical Society and approved for consideration by the Washington State Medical Association; therefore, be it

RESOLVED: That the Washington State Medical Association hereby approve this fee schedule with recommendations that it be adopted by the Workmen's Compensation Board of the State of Washington. We hereby refer this resolution to the Public Health League for further action.

This resolution was referred to the Resolutions Committee.

On motion of Dr. J. H. O'Shea, Dr. W. C. Speidel presented the following resolution:

WHEREAS: The value of the Woman's Auxiliary of the A. M. A. has proven such an aid, and

WHEREAS: Most of the States have such an affiliated organization and the delegates of the King County Medical Society approve of such organization; therefore, be it

RESOLVED: That the Washington State Medical Association give its sanction and authority to the formation of a Woman's Auxiliary in the State of Washington.

This resolution was referred to the Resolutions Committee.

Dr. A. T. Wanamaker presented the following amendment to the By-Laws:

Each component society shall be entitled to representation in the House of Delegates of this Association. Each society, except as provided in Article VIII, Section 5, shall be entitled to one delegate for each fifty members or a fraction thereof, who are active members of this Association, but each society holding a charter from this Association shall be entitled to one delegate. Delegates and alternates shall be elected at the annual meeting of their respective societies and formal notice of their election shall be made to the Secretary-Treasurer of this Association. Alternates shall be called to fill vacancies in the order of the number of votes cast for them. All component societies of this Association shall give their members at least ten days' written notice of the time and place of holding an annual meeting for the purpose of electing officers and delegates.

This proposed amendment was referred to the Resolutions Committee.

Dr. J. H. O'Shea presented the following resolution: Be it resolved that the Washington State Medical Association endorse the resolution of Dr. Shoulders of Tennessee, and forward a copy of this endorsement to the Council on Legislation and Public Relations of the A. M. A. This resolution reads as follows:

WHEREAS: The federal government has inaugurated the policy of rendering medical and hospital benefits to veterans of the World War with nonservice connected disabilities, and

WHEREAS: This policy was inaugurated over the opposition of the American Medical Association, and

WHEREAS, The policy now in force, if carried to its logical conclusion, involves the construction, the staffing, and the maintenance of a sufficient number of hospitals to accommodate the hospital needs of all the veterans of the World War, and

WHEREAS: Such policy places the federal government in unnecessary and unjust competition with the civilian hospitals and the medical profession of the United States, and

WHEREAS: The present policy is of unequal benefit to veterans by reason of the fact that many disabled veterans cannot (for one reason or another) avail themselves of the benefit; therefore, be it

RESOLVED: That the House of Delegates of the A. M. A. petition the Congress of the United States and the American Legion to abandon the policy of rendering hospital and medical benefits to veterans of the World War with nonservice connected disability, and substitute therefor a plan for disability insurance benefits with the following provisions:

First, the creation of a Bureau of Disability Insurance in the Veterans' Bureaus as now constituted.

Second, the issuance of a disability insurance policy to each veteran with a disability benefit clause as follows:

(a) The payment of a weekly cash benefit during a period of total disability, and

(b) The payment of liberal hospital benefit sufficient to cover the hospital expenses of a veteran during a period of hospitalization for any disability. Such benefits to be paid to a veteran on satisfactory proof of total disability, and

(c) Such other provisions as are necessary for the proper administration of the act. Be it further

RESOLVED: That the proper officers of this association be instructed to approach the officers of the American Legion with the view of securing the adoption of the policy above set out as a part of the legislative program of the American Legion, and be it further

RESOLVED: That each state medical association be requested to form a committee whose duty it will be to aprpoach the state and local Legion posts throughout the country with a view to securing the adoption of this program by them.

This resolution was referred to the Resolutions Committee.

Dr. J. W. Henderson presented the following resolution:

WHEREAS: Complaint has been made that there is a growing tendency to refer cases that come under the Medical Aid Department out of the State for examination and care, and

WHEREAS: In many cases this seems to be needless and expensive; therefore, be it

RESOLVED: That the Committee on Industrial Relations be instructed to make a thorough investigation to ascertain the truth or fallacy of this complaint and submit their findings as early as possible to each county medical society in the State with any recommendations they may have.

This resolution was referred to the Resolutions Committee.

Dr. H. J. Whitacre presented the following resolution: Be it resolved that the Washington State Medical Association endorse the resolution presented to the A. M. A. by Dr. Brook of Michigan, and forward a copy of this endorsement to the Committee on Miscellaneous Business. The resolution reads as follows:

WHEREAS: The Michigan State Medical Society, through its Committee on Civic and Industrial Relations, has made a comprehensive study of the filling out claim proofs of health and accident insurance companies; that this study has extended over a period of three years and has involved an extensive analysis of the subject, including a conference with representatives of several outstanding insurance companies; and that, as a result of such study and conference, the Michigan State Medical Society has adopted suitable resolutions providing for the charging of a fee to the insurance companies of not less than $2 for filling out each preliminary and final claim proof, and

WHEREAS: The Michigan State Medical Society, by its action in adopting such resolutions, has created the interest and favor of other state medical societies in the question, which equally affects every other state medical society; and that the Michigan State Medical Society has met with considerable opposition from the insurance companies, for the reason that they object strenuously to the plan, and point out that Michigan represents only a small section of the nation and should not undertake a project affecting the policy of all the insurance companies of the United States, and

WHEREAS: The rights and privileges of the individual physicians of the entire United States are involved and are being encroached on by the health and accident insurance companies, which are continuing to insist that the services of the physician in filling out claim proofs are part of the physician's professional obligation to his patient; that the insurance companies are unwilling to concede that the information given to them is for their own statistical use in properly adjusting claims; and that they are unwilling to pay the physician his fees; therefore, be it

RESOLVED: That the House of Delegates of the American Medical Association concur with and approve the action of the Michigan State Medical Society in adopting resolutions providing for the charging of a fee of not less than $2 for each preliminary and final claim proof; and that the House of Delegates of the A. M. A. authorize its Speaker to appoint a committee to whom this problem shall be referred; and be it further

RESOLVED: That this committee be instructed to study the facts and factors involved and to formulate a national policy that will result in remunerating physicians and surgeons for their services to insurance companies, when rendering these reports that contain expert opinions and professional advice; and be it further

RESOLVED: That the committee of the Association shall make a full report and recommendation at the next annual meeting of the House of Delegates of the American Medical Association.

This resolution was referred to the Resolutions Committee.

Dr. E. C. Leach presented the following resolution:

Be it resolved that the Washington State Medical Association endorse the resolution of Dr. Kopetzky of New York, and forward a copy of this endorsement to the Council on Medical Education of the A. M. A. This resolution reads as follows:

WHEREAS: Evidence is available to indicate that discrimination is being exercised against graduates of American medical colleges in various foreign countries relative to the granting of licensure by reciprocity or permission to practice medicine under conditions which pertain relative to graduates of local medical schools, and

WHEREAS: Such discrimination is unwarranted in view of the fact that the American medical schools from which such men have graduated maintain standards fully equal to, if not surpassing, some of the institutions graduating physicians in the countries concerned; therefore, be it

RESOLVED: That the attention of the House of Delegates be brought to this situation, and the Council on Medical Education and Hospitals of the American Medical Association be instructed by the Board of Trustees to make a survey of the conditions existing, and undertake by bringing the matter to the attention of the appropriate authorities in the countries in which such discrimination exists to secure for American physicians the privileges granted to physicians coming from those countries to the United States.

This resolution was referred to the Resolutions Committee.

Dr. H. E. Coe presented the following resolution:

RESOLVED: That a committee of five members of the Washington State Medical Association be elected by the House of Delegates, said committee to be known as the Committee on Ethical Relations, whose duty it shall be to secure, formulate and present to the Board of Trustees of this Association instances in which the best interests of the profession have been jeopardized by violation of the ethical standards of this Association, and of the A. M. A., and such an instance may be cited as the employment of lay or salaried solicitors who have been charged with the responsibility of securing contract or other forms of professional business. And be it further

RESOLVED: That through this committee, cooperating with the Board of Trustees of the W.S.M.A., a friendly suit be instituted in a court of competent jurisdiction in some county of the State of Washington to determine, if possible, what authority a component society of this Association has in the exercise of disciplinary measures involving either the suspension or expulsion of any of its members for violation of said ethical standards. And be it further

RESOLVED: That steps be taken by the Board of Trustees of this Association to protect this committee or any officer of the Association from financial loss in the event their right to exercise disciplinary powers be contested.

This resolution was referred to the Resolutions Committee.

Dr. A. H. Peacock presented the following resolution:

WHEREAS: The medical schools of the United States are graduating five thousand men and women yearly with the degree of Doctor of Medicine, and

WHEREAS: These young doctors of medicine after graduation are turned free to find hospital internships or locations to practice by chance or opportunity, and

WHEREAS: These graduates, after completing a hospital internship, find themselves in most instances without classification as county, city or institutional practitioners after spending a considerable sum for their education, and without locations, and

WHEREAS: The medical schools have assumed some responsibility in accepting, training, teaching and giving these graduates the degree of doctor of medicine; therefore, be it

RESOLVED: That the Council on Medical Education of the A. M. A. study this problem with the various medical schools, to the end that graduates of medicine shall be kept under the guidance of their individual medical school through a placement bureau until they have become duly located and actively enter the practice of medicine in one of its numerous fields of service. This will put greater responsibility upon medical schools in determining the fitness and qualifications of all candidates for the degree of doctor of medicine. Be it further

RESOLVED: That this resolution be presented to the next annual meeting of the House of Delegates of the A. M. A.

This resolution was referred to the Resolutions Committee.

Dr. A. O. Loe moved that a message of cheer be sent to Dr. W. C. Cox of Everett, Dr. C. J. Lynch of Yakima, and Dr. A. J. McIntyre of Hoquiam.

The House of Delegates then adjourned until nine o'clock the following morning.

Second Session

The second session of the House of Delegates was convened Wednesday morning, August 5. The following delegates answered the roll call: H. E. Cleveland, A. E. Anderson, J. T. Rooks, C. H. Thomson, J. H. O'Shea, D. H. Houston, S. L. Caldbick, H. J. Whitacre, C. J. Johannesson, H. C. Olmsted, George Anderson, Elmer Hill, Carroll Smith, P. J. Gallagher, W. B. Penney, A. E. Gerhardt, D. E. McGillivray, J. W. Henedrson, O. R. Austin, H. G. Miller, H. E. Coe, A. H. Peacock, C. E. Watts, O. A. Nelson, A. T. Wanamaker, A. O. Loe, Frederick Slyfield, W. C. Speidel, Roger Anderson, O. S. Proctor, R. J. McCurdy, Rush Banks, F. W. Anderson, H. G. Willard, W. D. Read, D. M. Dayton, E. C. Leach, C. L. Hoeffler, H. E. Rhodehamel, S. S. Oppenheimer, S. E. Lambert, R. J. Sprowl, E. J. Rhoades, J. R. Morrison, F. H. Brush and Kay England.

Report on Resolutions

The Resolutions Committee submitted the following report:

We, your Committee on Resolutions, wish to make the following report on the resolutions submitted to us.

1. Referring to the resolution proposing to pay expenses of the delegates to the A. M. A., we recommend for adoption the resolution as amended to include railway fare by direct route, pullman fare, hotel room, and five dollars per diem to be allowed during the period of necessary travel and duration of meeting, and that this allowance cover this year's meeting of the A. M. A.

Motion made and carried that this resolution be adopted.

2. Referring to the resolution submitted suggesting the appointment and election of seven men for the purpose of initiating a bill for passage at the fall election in 1932 with reference to the individual choosing his personal physician, this resolution is recommended for rejection, and

it is the desire of the committee to submit the following resolution:

WHEREAS: The Washington State Medical Association has previously declared itself as favoring the principle of free choice of physician, and

WHEREAS: The economic status of the physician of the State of Washington has been seriously jeopardized by the growing evils of contract, lodge and hospital association practice, inasmuch as they seriously interfere with the application of a free choice of physicians; therefore, be it

RESOLVED: That a committee of seven members of the Washington State Medical Association be elected or appointed to study the problem intensively and present constructive recommendations to the Board of Trustees.

This resolution is initiated by the resolution committee and submitted for your adoption.

This substitute resolution was passed with the amendment that the committee be elected by the House of Delegates. The following committee was elected: A. H. Peacock, Chairman; H. E. Coe, J. T. Rooks, W. B. Penney, W. A. Taylor, A. P. Duryee, and R. J. McCurdy.

3. Referring to the resolution on discrimination abroad against graduates of American medical colleges, we recommend its adoption.

Motion made and carried that this resolution be adopted.

4. Referring to the resolution with reference to the filling out of claim proofs of health and accident insurance companies, as submitted by Dr. Brook of Michigan to the House of Delegates of the A. M. A., we recommend its adoption.

Motion made and carried that this resolution be adopted.

5. Referring to the proposed amendment to the By-Laws of Washington State Medical Association of Article IV, Section 8, relating to the election of delegates, it is recommended for adoption with this addition, provided that if neither the duly elected delegates or alternates can attend the meeting, the President, Secretary and Board of Trustees, or Executive Committee of the local county society may certify both delegates and alternates, if a general meeting of the society cannot be held.

This resolution was voted on and rejected.

6. Referring to the proposed resolution in regard to a Woman's Auxiliary to the Washington State Medical Association, it is the desire of the Committee on Resolutions to submit this to the House of Delegates for a vote without debate.

This resolution was voted on and accepted.

7. Referring to the resolution suggesting the election of five members of this Association to serve on a committee to be known as Committee on Ethical Relations, your committee recommends that it be disapproved and wishes to submit for your consideration the following:

RESOLVED: That lay solicitation of contracts or other professional business, and the holding of contracts where patients are too far removed from the contracting physician to receive personal and adequate attention, shall be and are hereby considered contrary to the ethics of the Washington State Medical Association.

This substitute resolution was adopted.

8. Referring to the resolution concerning the care of recent graduates of medical schools, your committee recommends its adoption.

Motion made and carried that this resolution be adopted.

9. Referring to the resolution concerning the complaint that there is a growing tendency to refer cases that come under the Medical Aid Department out of the State for examination and care, your committee recommends that it be adopted with this alteration, that the Committee on Industrial Relations be instructed to submit their findings as early as possible to the Board of Trustees of the Washington State Medical Association instead of to each county medical society.

Motion made and carried that this resolution be adopted as amended.

10. Referring to the resolution on the policy of rendering medical and hospital benefits to veterans with nonservice connected disabilities, your committee recommends its adoption.

Motion made and carried that this resolution be adopted.

11. Referring to the resolution submitted by Drs. Wurdemann, Shannon, Millington, Peacock, Jacobson, and Nichols in regard to the proposed Medical Fee Schedule of the Workmen's Compensation Act, your committee recommends this resolution for adoption.

Motion made and carried that this resolution be adopted.

12. Referring to the resolution concerning the Medical Practice Act of the State of New York, and the proposed Grievance Committee plan, your committee recommends its adoption.

Motion made and carried that this resolution be adopted.

13. Referring to the communication from Dr. Woodward, Director of the Bureau of Legal Medicine and Legislation of the A. M. A., concerning cooperation with the Federal Commissioner of Narcotics, we recommend that this communication be referred to the Public Health League.

Motion made and carried that this be done.

14. Referring to the communication from Dr. Woodward concerning the appointment of a committee to investigate the feasibility of the establishment of a Criminologic Institute, your committee recommends that such a committee as suggested by Dr. Woodward be approved.

Motion made and carried that such a committee be appointed.

15. Referring to the address of President Dr. Anderson, your committee wishes to report that most of the features of his address are covered by the different resolutions. It is, however, suggested that it is the opinion of the House of Delegates that the Board of Trustees should meet at least four times a year.

Motion made and adopted that the Board of Trustees meet four times a year.

Dr. A. O. Loe presented the following resolution:

Washington State Medical Association urgently recommends to the Department of Labor and Industries that the practice of approving remote contracts, when good local professional service is available, be discontinued.

This resolution was amended to read at termination of present contract.

The amended resolution was adopted.

Dr. O. S. Proctor then brought up the matter of the proposed amalgamation of the Public Health League with this Association. Motion made that this matter be referred to the Board of Trustees and the Public Health League. This was passed with the amendment that a committee of three be appointed to make a study of the Oregon plan and report to the Board of Trustees.

Referring to the list of deceased members, we wish to present the following resolution:

WHEREAS: In the last year the members of the Washington State Medical Association have lost the friendly contact and worthwhile comradeship of several of our former members; be it

RESOLVED: That this organization hereby give expression to its sorrow and regret at the loss of these members, and that this resolution be incorporated in the minutes of this meeting.

Motion made and carried that the resolutions be adopted.

Election of Officers

The House of Delegates then proceeded to elect officers for the ensuing year as follows:

President, Dr. H. J. Whitacre, Tacoma, term expires 1932.
First Vice-President, Dr. J. T. Rooks, Walla Walla, term expires 1932.
Second Vice-President, Dr. W. A. Taylor, Ellensburg, term expires 1932.
Secretary-Treasurer, Dr. C. H. Thomson, Seattle, term expires 1934.
Assistant Secretary-Treasurer, Dr. J. H. O'Shea, Spokane, term expires 1934.

TRUSTEES

First District

Dr. S. L. Caldbick, Everett, term expires 1932.
Dr. A. H. Peacock, Seattle, term expires 1932.
Dr. A. C. Crookall, Seattle, term expires 1933.
Dr. A. O. Loe, Seattle, term expires 1933.

Second District

Dr. Carroll Smith, Spokane, term expires 1932.
Dr. P. J. Gallagher, Spokane, term expires 1932.
Dr. George Anderson, Spokane, term expires 1933.
Dr. A. E. Garhardt, Wenatchee, term expires 1933.

JOURNAL

Dr. H. G. Willard, Tacoma, term expires 1932.
Dr. S. E. Lambert, Spokane, term expires 1932.
Dr. C. E. Hagyard, Seattle, term expires 1932.

DELEGATES TO A. M. A.

Dr. Frederick Epplen, Seattle, term expires 1932.
Dr. W. B. Penney (alt.), Tacoma, term expires 1932.
Dr. J. H. O'Shea, Spokane, term expires 1933.
Dr. F. G. Sprowl (alt.), Spokane, term expires 1933.

The invitation of the Pierce County Medical Society to hold the next annual meeting in Tacoma was accepted.

Dr. J. H. O'Shea moved that a vote of thanks be given the Grays Harbor County Medical Society and St. Joseph's Hospital.

House of Delegates adjourned sine die.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

HEALTH ON THE FARM AND IN THE VILLAGE. A Review and Evaluation of the Cattaraugus Health Demonstration with Special Reference to Its Lessons for Other Rural Areas. By C.—E. A. Winslow, Dr. P. H., Professor of Public Health, Yale School of Medicine. Cloth, 281 pp. $1.00. The Macmillan Co., New York, 1931.

The author was invited by officers of the Milbank Memorial Fund to make a survey of the seven years experience of its health demonstration in Cattaraugus county of New York, with a view to summing up the lessons of this experiment so as to afford a practical basis for similar health service in other rural districts. This he has done very admirably. In the task he was ably assisted by other members of Yale Public Health Department and various medical specialists and nurses engaged in public health and social service work.

Cattaraugus county has 72,000 inhabitants with a per capita income of $900. This, surprisingly, is a relatively rich county, for about one-third of the counties in this country have an annual per capita income of less than $250, and two-thirds of the counties show a per capita income below $500. The trouble in securing proper rural public health service lies in the fact that the lower the per capita income of the rural dweller, the greater his ignorance and liability to sickness, and the larger the sum required for his care. In other words, the more the need of the service, the less is the county able to pay for it. State aid is, therefore, absolutely essential to carry out a public health program in the poorer counties, particularly in the South and in the Dakotas.

The per capita cost of public health service in Cattaraugus county is $2.20, which has been severally contributed by the county, state and private sources. To carry it out more adequately it has been found that the cost will be $2.40 per capita. The work is still in its infancy as Cattaraugus county is one of only a dozen counties in this country having the advantage of a proper public health service.

This service includes a full time county health unit; a school health service under a county director of school hygiene; a public health nursing service adequate for the area involved, well organized and perfectly integrated with the county health department. There are also services for tuberculosis control with clinic, nursing and hospital facilities; a consultation service for the medical profession; and a remarkably efficient laboratory for sanitary and research work exists. Besides these there is a trained sanitary engineer, and services exist for the care of crippled children and for nutritional and statistical studies.

The ratio of doctors to the population of the county is 1 to 1,063 persons, whereas in the country as a whole the proportion is about one doctor to some 700 people. As a result of the seven years work, there has been a marked reduction in morbidity and mortality among those below middle age, so that there is no question as to the advisability of such work throughout the rural districts. The essential difficulty seems to be the raising of the money. Public health, as Dr. Biggs oracularly remarked, is purchasable, and apparently the amount you get is directly dependent upon your outlay, within reason.

An enormous improvement has been secured in the water supply, mostly from wells, through the work of the sanitary engineer, while the quality of milk and control of communicable diseases have been likewise bettered.

Friction arose between the county medical society and the county public health officials, due to jealousies of the "outs" and personal animosities, but these have disappeared with time. This study of the gradual evolution of rural public health service by a master in his field will prove of inestimable value to all those interested in similar or allied work. WINSLOW.

NUTRITION AND DIET IN HEALTH AND DISEASE. By James S. McLester, M.D., Professor of Medicine at the University of Alabama, Birmingham, Ala. Second Edition, Revised and Reset. Octavo of 891 pages. Cloth, $8.50 net. W. B. Saunders Company, Philadelphia and London.

Within the past ten years there has been an increasing number of articles appearing in the literature with reference to the application of feeding programs to various pathologic and functional disturbances. One can see the tremendous

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GREEKS AND ROMANS GAVE NAMES TO OUR ANATOMICAL PARTS

In the body, one might find a bunch of grapes, a cuckoo bill, a small pan and a millstone, according to Lloyd Edwin Smith, writing in *Hygeia*. Many parts of the body were at first named by the old Romans and the Greeks for the commonplace objects that they seemed to resemble. The bunch of grapes (or its name means that in Latin) is the red lobe of the palate, the uvula. It hangs down from the soft palate as a bunch of grapes would hang between two leaves. The coccyx (cuckoo bill in Latin) was named because the curvature of these four bones at the end of the vertebral column was thought to look like the bill of a cuckoo. The patella is the movable bone in the knee. Patella in Latin means a small pan.

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progress made in this field by comparing the first and second editions of this excellent book. Those who are interested in reviewing the progress of these years will find it recorded in a very readily assimilable manner in this volume. It offers excellent material in this respect for both the practitioner and the student.

The chapter on diabetes is excellently written. It incorporates the modern conceptions in regard to managament. The introductory chapters covering carbohydrates, protein and fat metabolism are well worth intensive study. The conceptions portrayed in the paragraphs on the protein problem will interest all those concerned in the allergic field. These paragraphs open the way for much larger chapters, which one cannot help but feel will appear in a subsequent issue. The bibliographies are exhaustive and excellently chosen. The author can be congratulated on the work he has done and the contributions made to his colleagues through the presentation of this material.

Hofrichter.

Cutaneous X-Ray and Radium Therapy. By Henry H. Hazen, A.M., M.D. Professor of Dermatology, Medical Department of Georgetown University, etc., 166 pp. $3.00. The C. V. Mosby Co., St. Louis. 1931.

This book is condensed. Yet little has been left unsaid upon the subject under discussion. It is quite certain that the author has covered very clearly all of the most salient points relative to x-ray and radium treatment of cutaneous lesions. The chapters on malignant and benign tumors will be interesting and instructive, especially to roentgenologists. It is encouraging to note how high a percentage of basal cell cancers respond to x-ray and radium therapy. The greater portion of the book is devoted to the treatment of skin lesions which fall more particularly in the field of dermatology. This book should be of interest to the dermatologist who uses x-ray and radium therapy in his practice. While not a large volume, the book is quite comprehensive and will undoubtedly find a niche in many libraries.

Koenig.

Physical Diagnosis. By Warren P. Elmer, B.S., M.D., Assistant Professor of Clinical Medicine, Washington University, School of Medicine, etc., and W. D. Rose, M.D., Late Associate Professor of Medicine at the University of Arkansas. With 337 illustrations. 933 pp. $10.00. The C. V. Mosby Company, St. Louis, 1930.

After five editions of this book by Rose, the present author has revised it, retaining much of the original text. Part I features the technic of physical examination of the normal body with sections on clinical anatomy and physiology, preliminary observation, inspection, palpation, percussion, ausculation, sensory phenomena, reflexes and special diagnostic procedures. Part II considers physical diagnosis of diseases of the respiratory and circulatory systems with sections on each of these. Most of the space is devoted to the diseases of the thorax which the author considers most important. He states that the text should be used as a supplement to clinical and bedside demonstration. There are new chapters on cardiac arrhythmias and electrocardiac diagnosis. This is a practical and instructive textbook on the subject of physical diagnosis.

Eye, Ear, Nose and Throat for Nurses. By Jay G. Roberts, Ph.G., M.D., F.A.C.S., Chief of Staff, Eye, Ear, Nose and Throat, Los Angeles County Health Center, etc. Illustrated with 102 half-tone and line engravings. 213 pp. $2.25. F. A. Davis Company, Philadelphia, 1931.

The author states that in no department has the nurse's education been so neglected as in diseases and surgery of the eye, ear, nose and throat. That he may aid in correcting this weakness is his reason for publishing this book. A special effort has been made to acquaint the nurse with the name, purpose and care of the delicate instruments used in eye surgery. There are brief discussions of the hygiene and anatomy of the eye, ear, nose and throat. The diseases of each are described, the treatment for all being individually outlined. Special attention is paid to after-care and after-dressing of the different operations. The careful study of this volume will greatly increase the value of the nurse as an assistant in the specialty under consideration.

The Medical Clinics of North America. (Issued Serially, one number every other month). Volume 15, Number 1. (Mayo Clinic Number—July 1931). Octavo of 263 pp. with 56 illustrations. Per Clinic Year, July 1931 to May 1932. Paper, $12.00; Cloth $16.00 net. Philadelphia and London; W. B. Saunders Co., 1931.

This volume presents clinical reports from forty-two contributors, although fourteen of them are combined in pairs. This publication being confined to reports of internists, it is significant of the enormous personnel in the Mayo Clinic. The absence of duplication of clinical cases is noticeable in this volume, a very wide range of medical subjects being thus considered. These cover lesions in all parts of the body. Neoplasms of the thorax, stomach and other abdominal organs are presented. Gastric and duodenal ulcers receive due consideration. There are several reports on disturbances of the circulatory system. New names appear among these writers, with a notable absence of former leaders in this clinic, demonstrating the changes that necessarily accompany the progress of time.

Recent Facts on Transmission of Tuberculosis. J. Arthur Myers, Minneapolis (*Journal A. M. A.*, Aug. 1, 1931), deprecates the fact that students of medicine and nursing are being left with the impression that it is a good thing to come in contact with patients suffering from tuberculosis and receive just the right dose to give them a positive tuberculin reaction. Under such conditions the dosage is entirely uncontrolled. The number of bacilli which the student's body receives from contact with tuberculous patients may vary from a few to huge numbers. Where careful observations have been made in this country, it has been shown that approximately 30 per cent of the probationers in schools of nursing react positively to the tuberculin test but, after they have taken tuberculosis services, from 80 to 100 per cent have been found to react positively. Since a positive reaction indicates an allergic state and since there is reason to believe that the destructive phase of tuberculosis is brought about by the allergic reaction, it would seem obvious that nothing but harm has been done by allowing students to take unmeasured doses of bacilli into their bodies and develop a state of allergy. But what immediate evidence is there that allergy is dangerous to the students? The best evidence is that from 5 to 12 per cent of student nurses have presented themselves with tuberculous disease that required treatment soon after allergy was manifested by a positive tuberculin reaction. Pleurisy with effusion is looked on as one of the early manifestations of tuberculosis. In itself, it is an allergic reaction. Many patients are desperately ill from it over a considerable period of time. Abundant clinical experience has taught that pleurisy with effusion is frequently followed by pulmonary tuberculosis of the destructive type. Therefore, in the light of such evidence, who will dare state that an allergic reaction, as manifested by the tuberculin test and brought about by exposure to human beings suffering from tuberculosis, is of benefit to a student?

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CHRONIC PYURIA IN CHILDREN*

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Urinary tract infection is regularly manifested by pyuria and in children not only occurs frequently but under the age of two is of higher incidence than any other disease. The appearance of pyuria with or without other urinary tract symptoms or general manifestations of infection (chills, fever, gastrointestinal upsets and so forth), commonly leads to the diagnosis of pyelitis. Fortunately, in most instances the urinary infection is self-limited and disappears in two to four weeks, irrespective of the treatment employed.

There are, however, a certain number of these juvenile patients, in whom the pyuria and other evidence of infection persists longer than one month, even though an intensive therapeutic attack has been made. In these cases of persistent pyuria the diagnosis of "chronic pyelitis" is made quite universally. As will be learned by a careful study of a series of these patients, this diagnosis is as insufficient or incorrect as the diagnosis of chronic laryngitis when the disease is chronic pulmonary tuberculosis. As a rule, the correct diagnosis can be made only by special urologic examination. By this means it is found that so-called chronic pyelitis is rarely an uncomplicated disease, that cure by medical treatment alone cannot regularly be hoped for, and that frequently radical urologic surgery is demanded to save life.

The field of urology in infants and children is not only large but comparatively recently entered. Because in the past investigations in this branch of medicine have been meagre, pediatric textbooks contain little of practical value concerning either the etiology or pathology of chronic pyuria, let alone treatment. During the past few years, since the introduction of miniature cystoscopes, urologists all over the world have contributed a voluminous record of clinical experiences with urinary tract diseases in juveniles. It is hoped that the fruition of this work will be manifested in a more intelligent management of these young patients suffering with chronic pyuria.

Already, in many localities, closer cooperation between the child's physician and the urologist has resulted in startling diagnostic findings and therapeutic results. With wider dissemination of the fundamentals of this phase of medicine, far greater achievements may be anticipated. At present I know of two medical schools* in which upper class

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* From the Departments of Urology, Children's Medicine, Children's Surgery and Pathology, Bellevue Hospital (New York University and Bellevue Hospital Medical College), The Babies' Hospital (Department of Pediatrics, Columbia University) and the Pediatric Service of The New York Nursery and Child's Hospital (Cornell Medical College).

* Read at the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., Aug. 3-5, 1931.

* College of Physicians and Surgeons, Columbia University, and New York University and Bellevue Hospital Medical School.

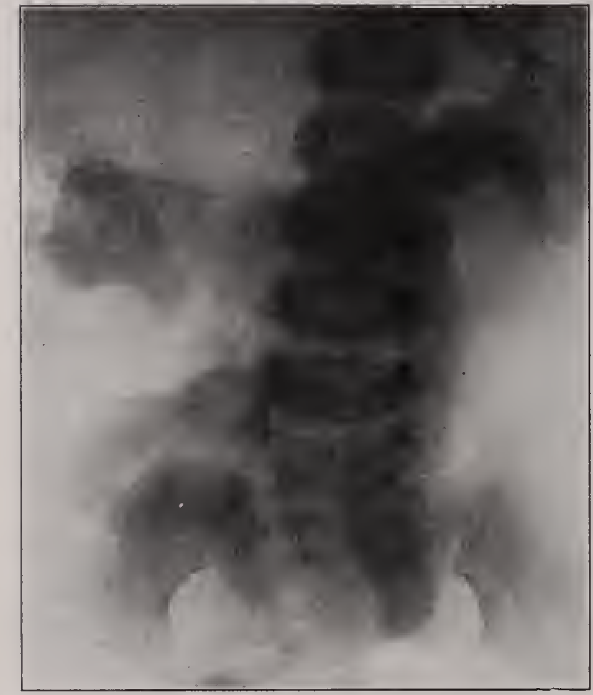

Fig. 1. Congenital bilateral stricture of the ureterovesical junction in girl of 13 months admitted to the hospital for "chronic pyelitis." Because ureteral catheterization was found impossible, intravenous urogram with iopax (shown above) was made. Enormous dilatation of the upper urinary tract on each side is shown, extending down to ureterovesical junction. Because of extreme illness and meagre renal function, bilateral ureterostomy was performed; both ureters were brought out onto the loin. Temporary improvement for one month. The child then developed bilateral suppurative otitis media which required bilateral myringotomy. Death after six weeks. Autopsy confirmed urologic diagnosis with the additional finding of two ureters on the right side.

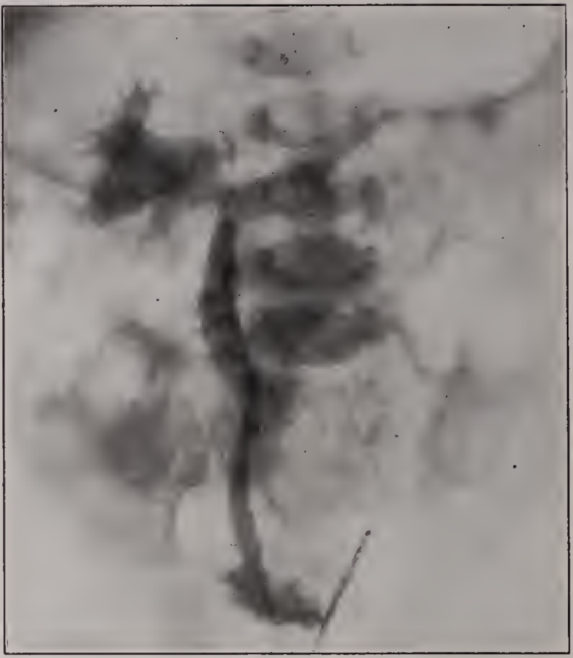

Fig. 2. Congenital ureteropelvic stricture in female of four months examined because of persistent pyuria with fever. A hydronephrosis (infected with a pure culture of Flexner dysentery bacillus) was found; the kidney was also ptosed. The ureter other than in the stricture area is dilated but no ureterovesical obstruction could be made out. Marked improvement following ureteral dilatation. That the stricture lesion is probably not simple ureterospasm is indicated by identical urograms taken six months apart over a one-year period. No urographic change followed ureteral dilatations by the passage of 3 No. 4 F. catheters side by side to the kidney pelvis. The urine is now (two years later) sterile but contains scattered leucocytes. If it becomes evident that there is increasing renal damage by urinary backpressure, a ureteropelvoplasty will be required. Without the establishment of free kidney drainage in such a case, ultimate hydropyonephrosis is likely.

students have this subject presented to them through the pediatric department by a urologist. At the request of the respective departmental professors the writer inaugurated this teaching three years ago; already the interest in juvenile pyurics manifested by recent graduates amply demonstrates that other medical schools may advantageously offer similar instruction. By force of clinical demonstration older practitioners are more and more becoming aware of the diagnostic and therapeutic possibilities which modern urologic methods afford.

ETIOLOGY

Predisposing factors: Urinary infection may occur at any age. I have seen four infants, in whom pyuria was noted from birth; acute renal infection has been reported in children forty-eight hours old. To repeat, under the age of two, the incidence of urinary tract infection outranks all others.

As is well known, acute urinary infections occur most often in girl babies; the incidence ratio of girls to boys is as ten to one. However, the vast majority of these infections are self-limited, clear up promptly and in most instances are pathologically acute urethrotrigonitis rather than renal infections. To me this high incidence in females is explained by the short urethra (0.8 to 1.5 cm. long) which is continuously bathed in feces and is connected with the upper urinary tract through subtrigonal lymphatics. In the statistical study of 207 cases of chronic urinary infections we found 159 females, 49 males, a different ratio—three to one. We believe this incidence ratio difference in girls and boys indicates urethrocystitis is too frequently diagnosed acute pyelitis and with free bladder drainage the infection disappears promptly.

Obstructive lesions were most often found in the female ureter and in the male bladder outlet. As is well known, any lesion which causes urinary stasis predisposes to and perpetuates urinary infection; as long as stasis-producing conditions exist, cure of the infection should not be expected. While obstruction or blockage is most commonly found,

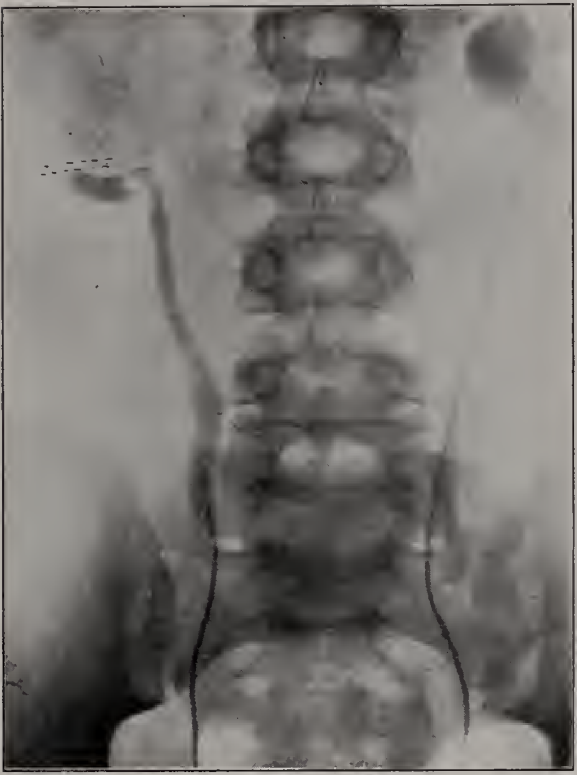

Fig. 3. Infected hydronephrosis due to aberrant renal polar vessel obstruction in 11-year-old boy. Seven year history of pain in loin (left, picture reversed; the right kidney outline is normal) with emergency nephrosotomy five years ago for acute hydronephrosis. Chronic pyuria with intermittent hematuria and fever prompted urologic examination. Preoperative diagnosis of aberrant vessel obstruction confirmed at operation. Course of vessel is indicated by dotted line; the ureter was almost occluded by the vessel just below the ureteropelvic junction. Nephrectomy for far advanced hydronephrotic destruction. Uneventful recovery. A severe toxic nephritis of the right kidney existed preoperatively, but with the removal of the "dead" infected mate, it has now disappeared.

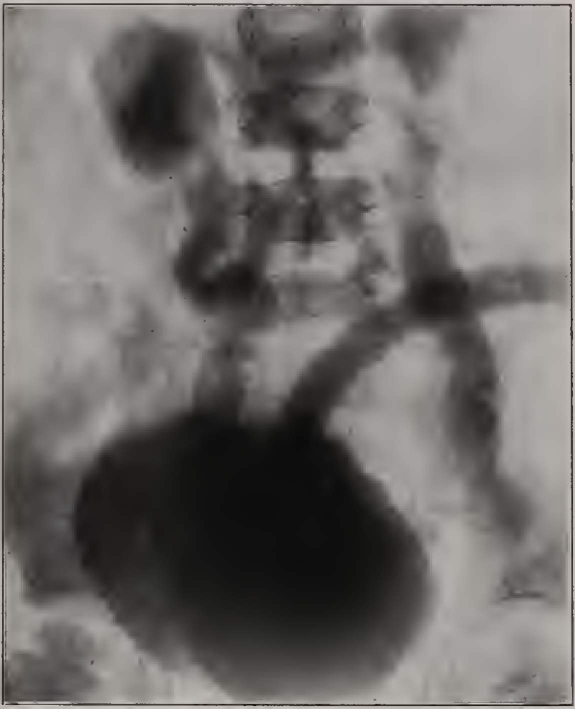

Fig. 4. Congenital contracture of the bladder outlet in a two-year-old male examined because of "chronic pyelitis" of eighteen months' duration. Cystoscopic diagnosis. Urologic findings were: residium 4 to 5 ounces; urine 15 to 20 per cent pus by volume; phenolsulphonphthalein output (best) 37 per cent in two hours; nonprotein-nitrogen 42 mgms. per 100 cc. of blood. Treatment: Suprapubic cystotomy for six weeks, followed by transurethral resection of bladder outlet obstruction by the electric cutting current. Uneventful recovery. Examination six months later showed no residuum or ureteral reflux; urine sterile but still shows a few leucocytes microscopically; phenolsulphonphthalein output 70 per cent in two hours; nonprotein-nitrogen 29 mgms. The above cystogram made by bladder filling (5 per cent sodium iodide) through the suprapubic tube shows a greatly dilated bladder and upper urinary tract, a marked and widespread damage. Unquestionably early and proper surgical intervention in this case of "chronic pyelitis" saved this boy's life.

occasionally neuromuscular atonia converts the urinary channels into flabby reservoirs. In children most stasis-producing lesions are congenital anomalies. Autopsy studies have shown that these anomalous developments are of frequent incidence. In a recent autopsy study in 2420 pediatric cases at Bellevue Hospital, we found congenital ureteral obstructions in 2 per cent of all cases; stricture existed in half of these (figs. 1, 2, 3). Next in frequency are urethral obstructions, particularly those at the bladder outlet, congenital contracture of the vesical neck (fig. 4), and congenital valves of the posterior urethra (fig. 5). Simple atresia of the meatus must not be overlooked; it is extremely common and may cause marked upper tract destruction.

Not only may the urinary infection be secondary to a focal infection elsewhere, but it may be perpetuated by constant bacterial feeding from this focus. If the focus is in the intestinal tract, constipation serves to enhance its activity. Constipation alone increases the toxic excretory labors of the kidney and may, thereby, retard healing of the renal lesion. Therapeutic elimination of focal infections and feces are both requisite for the successful treatment of persistent urinary infections.

Bacteriology: While it is commonly believed that practically all urinary infections in children are due to the colon bacillus, this is untrue. The members of the gram-negative colon-typhoid group, especially B. coli communior, are found in two-thirds to three-fourths of all cases; the bacteria of the gram-positive coccus group, represented chiefly by staphylococci, are common invaders. In fact, it is believed by many that at the onset the infection is nearly always due to gram-positive cocci and colon bacilli are present only as secondary invaders.

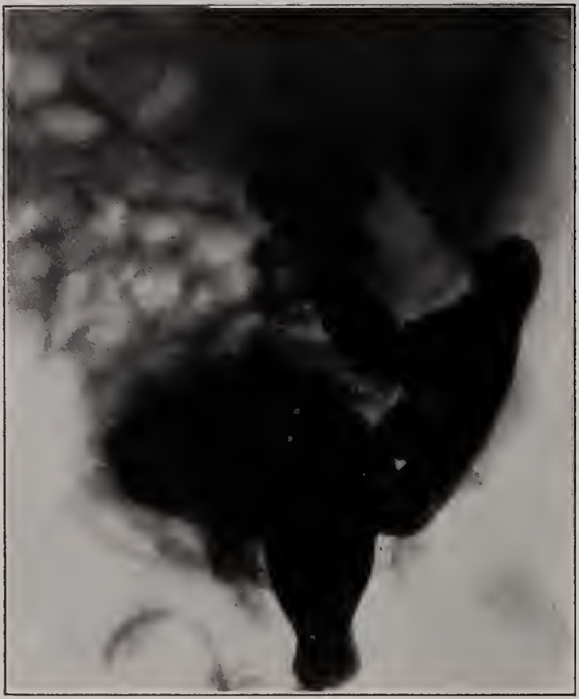

Fig. 5. Congenital valvular obstruction of the posterior uretha in a male of five weeks, admitted to the hospital because of pyuria and dysuria. These valves are mucosal leaflet redundancies, are usually connected with the verumontanum and pass anteriorly to the lateral urethal walls or posteriorly into the bladder outlet. As the urinary stream strikes them, the valves balloon into cusp formation and obstruct outflow. Thus backpressure damage of the entire urinary tract above is produced. The cystogram in this case shows marked dilation of the posterior urethra behind the valves (the pyriform infundibulum), a dilated bladder and greatly dilated and elongated left ureter above. In another cystogram the same condition was demonstrated on the right side. A marked infection existed. Treatment: cystotomy drainage; uremic death ten days later. This condition is not uncommon; I have seen thirty-four cases to date. Destruction of the valves by transurethral or suprapubic approach is the ultimate treatment; frequently preliminary free bladder drainage is indicated as in this case.

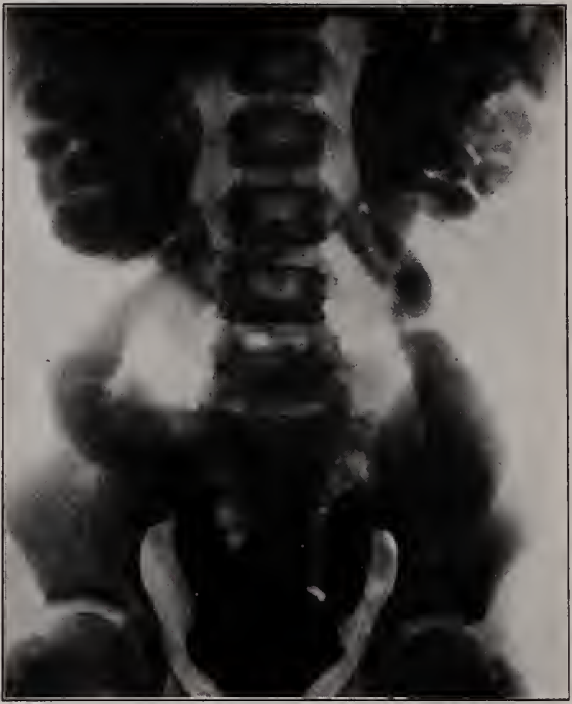

Fig. 6. Cystogram showing marked dilatation of upper urinary tract in 10-year-old girl with neuromuscular vesical disease. She was admitted to the hospital for pyuria but had been treated the past five years for failure to gain weight. Treatment: suprapubic cystotomy with with subsequent "punch" resection of bladder outlet. By this method, the residual urine was reduced from 180 to 20 cc. Marked renal destruction is evident; pyuria persists but uremic death is less imminent.

However, careful bacteriologic studies do not confirm this belief, although they do show that in the early stages of the infection the incidence of staphylococcic infection, especially in pure culture, is higher than later. In our series (207 cases) we found B. coli in 80, staphylococci in 67, streptococci in 17, typhoid bacilli in 10. Various other organisms were also found, of which tubercle bacilli, dysentery bacilli (Flexner) and the enterococci were outstanding. In a recent series reported by Young, the incidence of staphylococci exceeded that of colon bacilli.

Routes of invasion: While it is probable that most acute renal infections are of hematogenous origin, from clinical studies we are convinced that in certain instances the ascending (lymphogenous or urogenous) is the route of invasion. Without most careful urologic examination, renal infection may be erroneously diagnosed when the disease is limited to the bladder. In some of these cases we have found intense vesical infection with normal sterile urine from the kidneys. The sequence of urinary disturbances, pyuria, urinary tract pain and later systemic symptoms of toxemia lead to the incorrect diagnosis of acute ascending renal infection. It should be remembered that children may become extremely ill by toxic absorption from an intense bladder infection alone.

PATHOLOGY

The pathologic changes in the urinary tract associated with chronic pyuria vary greatly according to the site and nature of the underlying lesion. Rarely does infection exist without renal involvement. When obstruction is present, there is dilation of the tract above with a variable degree of inflammatory involvement of the channel walls. With infravesical blockage, both ureters and kidneys are injured. The kidney lesion is an interstitial focal suppurative nephritis; hydronephrosis with parenchymal thinning and scarring commonly coexists with obstruction and when bilateral, is most serious. Histologic renal study reveals localized and diffusely scattered areas of inflammation and suppuration in the interstitial tissues; usually the glomeruli show little destruction.

In the early stages tubular damage is slight unless there has been urinary backpressure, when dilation will be found. Later tubular degeneration is commonly noted. As a rule, changes in the pelvis are comparatively meagre; induration of the walls and a granular roughening of the mucosal surface are most often found. Because of the histologic findings in these cases, it is at once apparent that on a pathologic basis the correct diagnosis is suppurative pyelonephritis rather than the commonly used and clinically convenient designation, pyelitis. Pyelitis without parenchymal involvement should be considered clinically nonexistent.

SYMPTOMS

Pyuria may be the only symptom of chronic urinary infection and may be discovered only by routine urinalysis. Usually, however, attention is directed to the urinary tract by symptoms of vesical irritation (dysuria, frequency or burning), hematuria, pain or a mass along the upper tract. In half of the cases of so-called "chronic pyelitis," gastrointestinal symptoms exist and may be so marked as completely to misdirect attention and cause the urinary disease to be overlooked. Anorexia, loss of or failure to gain weight, "biliousness," "indigestion," "gastritis," flatulence, constipation or periodic diarrhea are often the outstanding symptoms.

Recently in a pasty anemic girl of 10 with the physical development of six years, who had been treated five years for stomach trouble and failure to gain weight, urologic examination revealed neuromuscular vesical disease with bilateral far advanced backpressure destruction of the upper urinary tract (fig. 6). One week before hospital admission, the family physicial found pus in the urine! On sedimentation, her urine contained 15 to 20 per cent pus by volume.

A low grade fever is frequently noted. With acute urinary obstruction, the temperature may be high with chills and sweats. Whenever a persistent fever of unexplained origin exists in a child, always examine the urine. Too frequently in children with toxic meningismus, due to acute renal infection, a spinal tap is done before a urinalysis.

When there is considerable renal damage by infection or urinary backpressure, the patient usually manifests neurologic symptoms. Headache is perhaps commonest. The child may be apathetic, nervous or irritable. Only in advanced uremia is the patient stuporous. However, many of these patients live months or years in a suburemic state and are considered by their parents only as "not doing well."

DIAGNOSIS

When the patient is an infant or very young child, the history must be obtained from the parent; frequently it is of little value. In older children we have found direct questioning of great aid. Pain in the side or over the bladder, dysuria, frequency or hematuria will direct attention to the urinary tract. Often, in cases of hydronephrosis, the mother or child has told us that the loin mass varied greatly in size. A complete physical examination will sometimes reveal the primary focus of infection (e. g., in the respiratory tract, tonsils, ears, bronchitis or even pulmonary tuberculosis). A high blood pressure may indicate advanced renal damage. Palpation may reveal genitourinary tract masses; pyuria may be due to prostatitis, even in young boys.

Frequently vaginitis is the true cause of "chronic pyelitis" (pyuria) and for this reason urinary specimen collection in females should always be by catheterization. Time and again we have seen young girls with pus-laden voided urine, whose catheterized specimens were normal. This error is common. In boys a satisfactory specimen can usually be obtained by voiding. The prepuce is first washed and retracted, the meatus cleansed with soap or alcohol and the specimen collected only after a few cubic centimeters of urine have been passed. Inasmuch as the urinalysis (especially for pus, blood and bacteria) is the foundation of urologic examinations, scrupulous care must be exercised in urine specimen collection or the laboratory report may be seriously misleading; smegma has been reported as tubercle bacillus. Bacterial examination both by stain and culture is a part of every complete urinalysis, when urinary infection exists. Determination of the character of the invading organisms may influence the therapeutic effort.

When pyuria persists longer than one month despite intensive medical treatment, a complete urologic examination is indicated. Occasionally such a course of treatment serves to cure the infection. The outstanding phases of this treatment are elimination of focal infections, intestinal elimination, nutritional feeding and the liberal administration of the so-called urinary antiseptics. In our hands methenamine in large doses (with the requisite urinary acidulant) has given the best results, although we are aware that others strongly advocate the newer dye preparations — pyridium, neutral acriflavine or the drug hexylresorcinol (caprokol). We give methenamine in dosage of 10 to 12½ grains per day per year. A four-year-old child receives 40 to 50 grains per day, depending upon his size, weight and the intensity of the infection.

Although one encounters methanamine idiosyncrasy in children, rarely have we found its use contraindicated. With intolerance there is marked frequency, dysuria or even hematuria. The latter is bladder bleeding only and ceases with drug withdrawal. We have given as high as 90 grains in twenty-four hours without ill effect but 75 grains per day is our average maximum dose. A urinary acidulant suffiicent to render the urine strongly acid to litmus is coadministered; acid sodium phosphate 40 to 60 grains or ammonium chlorid 10 to 15 grains per day may be employed. If the urine is normally strongly acid, little or no acidulant will be required. The methenamine and the acidulant are given four to six days; a two to four-day rest period is observed and the drug then repeated. Bacteriologic cure, as determined by two negative cultures, is sometimes obtained by this treatment alone.

Occasionally we find patients who are intolerant to large doses of methenamine but who show no drug reaction, if the dosage is reduced 10 to 15 grains per day. Our practice is to stop the medication for two days, when it is resumed in the smaller dosage. If, after a month of intensive treatment the infection and pyuria persist, a complete urologic examination should be performed.

Before resorting to cystoscopy certain precystoscopic data are acquired. This includes blood chemistry (nonprotein-nitrogen or blood urea, CO_2), a two-hour intramuscular or a one-hour intravenous phenolsulphonphthalein renal function test and a plain roentgenogram of the urinary tract for calculi, unusual shadows or congenital spinal defects, especially spina bifida. Routinely we make a cystogram by filling the bladder with a radiopaque mixture (we use 5 per cent sodium iodide or iopax), after which a roentgenographic exposure is made. Thus the bladder outline is determined and ureteral reflux or filling of the posterior urethra is demonstrated (fig. 5). Sometimes the cystographic data obtained render cystoscopy unnecessary; in many instances one finds both upper tracts well outlined and pyelography is not required.

In addition to cystography we are now using intravenous urography in most cases preliminary to cystoscopy. By this method one often obtains considerable valuable advance information and occasionally it offers our only recourse, when one or both ureters cannot be catheterized. Our results with intravenous pyelography in children have not been uniformly satisfactory; certainly the films obtained are not comparable in clarity and diagnostic value with those obtained by retrograde urography. Furthermore, in children one must begin taking pictures at the end of intravenous injection; frequently all of the contrast medium is in the bladder at the end of ten minutes. In children under five years we make roentgenographic exposures every three minutes for fifteen minutes, and in children over five years every five minutes for twenty minutes. At the second exposure stereoscopic films may profitably be made. If the initial pictures indicate slow excretion or urinary retention in the upper tract, the period between exposures is lengthened; sometimes follow-up films are made one, two or even three hours later.

Having acquired the above data, cystoscopy is carried out. In girls under five and boys under seven or eight years general anesthesia is usually required. Occasionally local urethral anesthesia is adequate. Occasionally in older children nervousness or hyperirritability of the bladder or urethra demands a general anesthetic; without it instrumentation is not only unsatisfactory but dangerous.

The cystoscope is introduced, the bladder and posterior urethra are studied, catheters are passed to each kidney pelvis, separate specimens obtained for microscopic, chemical and bacteriologic analysis, and divided renal function tests made. For renal function estimation, routinely we use indigo-carmine intravenously, although phenolsulphonphthalein is the dye used by most others.

When indicated a pyelogram is made. If there is no contraindication (sick patient or poor total renal function), bilateral pyelograms are usually made. While there are many who advise against this procedure, if gently performed with due cognizance of indications and contraindications, much additional information may be obtained and often the patient is saved a repeated instrumentation. We use 20 per cent iopax for retrograde pyelographic injection; roentgenographic definition is not only more clear but, in addition, this medium is non-irritating. Severe uretral spasms or postcystoscopic pain rarely develop with its use.

In the majority of cases of chronic urinary infection, the correct diagnosis can best be made by the above systematic method. It is found that infants and children suffer with nearly all of the urinary tract diseases which we are accustomed to associate only with adult life. Thus one finds urethral stricture, contracture of the vesical outlet, congenital valvular obstruction of the posterior urethra, prostatitis, urethrotrigonitis, vesical stone, diverticulum, neuromuscular disease or infection, ureteral stricture, stone, a great variety of anomalous ureteral conditions, and in the kidney every lesion known to exist in adults. These are the more common findings. In many, radical urologic treatment is demanded.

Unfortunately, practitioners in general and pediatricians in particular are reluctant to offer these sick children the advantages of a complete urologic examination, preferring to treat them months or years under the mistaken diagnosis of pyelitis. If death ensues, chronic interstitial nephritis is the usual terminal diagnosis for the actuary. As a rule, it is far easier to convince the parents of the child than the physician of the desirability of a urologic examination.

The outstanding objection encountered by urologic colleagues and myself is the fear of post-instrumental morbidity or even mortality. In the hands of a properly trained specialist, this should be of little or no consideration. If the immediate condition of the child does not warrant such an examination, it will probably be postponed until a more auspicious time. On the other hand, all evidence indicates that children withstand cystoscopic investigation much better than do their elders.

In a recent study of temperature reactions, following 358 complete cystoscopic examinations with pyelography performed by me, but one in ten (9.2 per cent) had a temperature elevation above 100° F. which did not return to normal within forty-eight hours. It is to be borne in mind, moreover, that two-thirds of these children were given a general anesthetic. A comparative check-up with 300 similar examinations in adults at Bellevue Hospital (and these were not given a general anesthetic) showed that the morbidity incidence in children was less than half that in adults. Surely we are not justified in denying juvenile patients, in whom the risk is less than half as great, the same thorough examination and treatment that we as adults demand for ourselves.

TREATMENT

An outline of the medical therapy which has served best in our hands has been given. By this method a cure will be obtained in a few cases and in others the infection can be controlled. Unless the infection is cured within a four to six-weeks period, a complete urologic examination should be carried out; with surprising frequency it will be found that a lesion exists which requires special instrumental or surgical treatment.

By instrumental treatment is meant such procedures as urethral or ureteral dilation, pelvic lavage (if one chooses to use this method, we do not), litholapaxy, destruction of posterior urethral valves or resection of the contracted bladder neck by the electric cutting current. While, strictly speaking, these procedures are surgical, we consider them less formidable than incisional attacks. Thus by instrumental means we seek to eliminate urinary stasis and by these methods, coupled with the liberal use of urinary antiseptics, cure of infection will be achieved in a gratifying number of patients, while in a relatively large number of others the disease will be adequately controlled.

Likewise, by radical surgical methods one attempts, insofar as possible, the elimination of obstructive factors causing urinary stasis. Usually some type of plastic surgery is required. In other cases the infective process is so advanced that nothing less than radical extirpation of a portion of the tract suffices. The removed tissue may be the entire kidney or only a portion of it (heminephrectomy) or perhaps a vesical diverticulum. The wide variety of operations which may be required is suggested by the following procedures employed by me in the surgical treatment in 207 cases of chronic pyuria (it need scarcely be added that every patient was not operated upon): meatotomy, urethrotomy, excision of posterior urethral valves, resection of the bladder neck, punch operation on the bladder outlet, cystotomy, diverticulectomy, section of ureterocele, transvesical resection of uretrovesical junction strictures, resection of the trigone, bilateral resection of ureters, resection of pelvic aberrant vessels obstructing the ureter, bilateral ureterostomy, ureteronephrectomy, ureteroheminephrectomy, nephrectomy, nephrostomy, pyelotomy, resection of aberrant renal polar vessels, incision and drainage of perinephric abscess.

Here, again, it is surprising how admirably infants and children withstand major surgical attacks. One of our patients, in whom we did a complete extirpation of a pyoureter and resection of the pyonephrotic upper half of a double kidney (heminephrectomy), was but six months old! Her convalescence was uneventful and she is now cured of the pyuria. If one will employ blood transfusion liberally as well as glucose-saline solution postoperatively, the recuperation of the child will be aided to the utmost and acidosis will be successfully combatted. In infants and children the sudden onset of acidosis during the first forty-eight hours postoperatively is probably the greatest surgical concern.

RESUME

It has been pointed out that, when chronic pyuria exists, the diagnosis of chronic pyelitis is usually made and the child is inadequately treated for months or years.

Because the renal lesion is primarily a suppurative interstitial nephritis and the pelvic changes are of lesser importance, we believe the pathologically correct designation pyelonephritis should supplant the clinically convenient though inadequate term pyelitis. These patients should be given the benefit of an intensive course of medical therapy as outlined but if, after one month, they remain pyuric, a complete urologic examination should be carried out.

From a large clinical experience in this field it is found that infants and children may suffer with almost every one of the various types of urinary tract diseases which in the past we have been accustomed to consider as adult lesions. The treatment of these diseases in juveniles differs in no wise from that when the patient is an adult.

It cannot too urgently be stressed that these young patients are entitled to the same advantages of modern urologic methods which we as adults demand for ourselves; especially since in juveniles the morbidity risk entailed by examination is less than half that in adults. Only by this method can the correct diagnosis be made and only by radical surgical treatment will many of these children be permitted to enjoy adult life.

140 East 54th Street.

NEW METHOD OF EMPLOYING SKELETAL TRACTION *

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Progress made in fracture treatment has not been consistent with the stimulus received and results gained from the World War. From the increasing incidence of motor accidents traumatic surgeons have begun to realize the need of improved technic, and although there has been some improvement of late in both method and function, much work needs to be done. With that in view we are presenting this new method.

This original apparatus, which may be defined as direct skeletal traction with well leg countertraction, simplifies modern fracture reduction in operative and nonoperative work. The advantages—application, functional and economic—are many, both to surgeon and patient, for it shortens the period of hospitalization; it conserves the time of the surgeon, and produces better results.

The sound or uninjured leg has been employed for centuries for immobilization in treating fracture and dislocation of the lower extremity. Later, the double spica cast was devised for the following conditions: fractured neck of femur, dislocation of the hip and pelvic injuries. Thus immobilization of the good leg has been used by surgeons for many years. Such men as Michael Hoke, A. Steindler, D. P. Wilkie, C. K. Coonse and Sarl P. Jones have used the well leg for both immobilization and countertraction.

There is no need to review the history of skeletal traction. Its application by means of tongs, calipers, wire, nails or pins has been in general practice for years, and because of the wide range of their practicability the advantages are well known.

Although time has not permitted a complete survey of all literature, contemporary authorities have listed all types of apparatus, the results of which justify their survival. Therefore, we believe we are correct when we claim originality for this method which combines skeletal traction of the injured leg with countertraction of the well leg, and this adjustable splint, which we have devised, is also original.

We have successfully used our method in fractures and injuries of the pelvis, in dislocation of

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* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., Aug. 3-5, 1931.

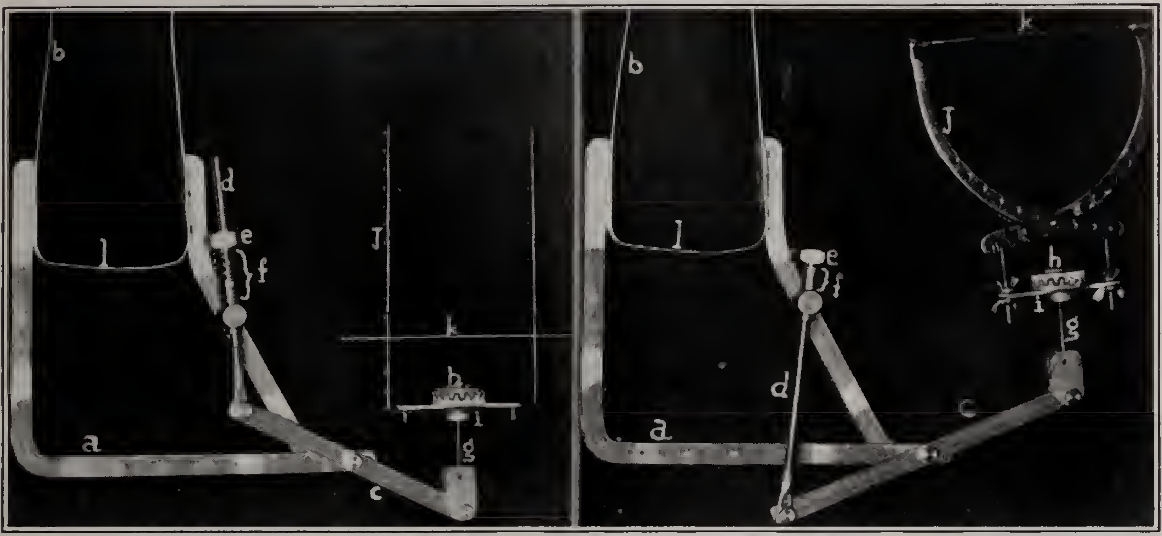

Fig. 1.

Fig. 2.

Figs. 1 and 2. The skeletal traction and well leg splint. a, Frame or base; b, countertraction stirrup; c, lever arm; d, countertracton rod; e, countertraction nut; f, cushion countertraction spring; g, traction rod; h, rotation adjustment; i, rotation lock nut; j, perforated traction stirrup; k, traction pin or wire; l, removable part of stirrup.

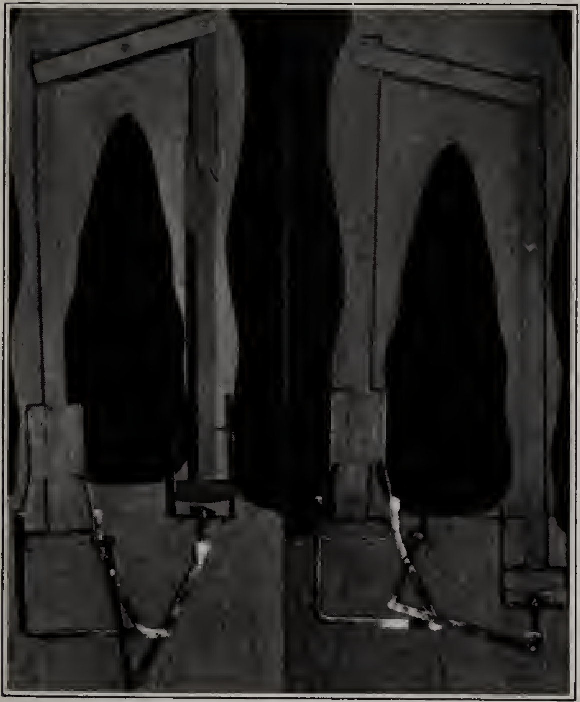

Fig. 3. A graphic form of application for fracture of shaft of left femur, showing how the traction force pulls the acetabulum down, thereby obtaining wide abduction at that hip joint.

the symphysis pubis, in fractures of the femoral neck, in intertrochanteric and in femoral shaft fractures, as well as in certain fractures of both bones of the leg. This is the first time that fracture of the shaft of the femur and both bones of the leg have ever been treated in like manner and by the same principle.

The splint is unique in that it is capable of wide adjustment after its application. By means of an adjustable nut, internal or external rotation may be had at any time, without any letting up on traction; by changing length of lever, abduction or adduction can be obtained; and by raising or lowering the feet, changes in flexion and extension can be brought about.

CONSTRUCTION

This appliance (figs. 1 and 2), made entirely of aluminum and weighing less than two pounds, consists of a frame or base (a) to which is attached a countertraction stirrup (b) which is incorporated in the cast of the well leg. A transverse lever arm (c) is pivoted on this stirrup, the axis of which is several inches distal to the sole of the well foot. To this end of the lever is connected a threaded rod (d), on which a nut (e), turned by the fingers alone, furnishes the traction force. A coil spring (f), under the traction nut, is for the purpose of maintaining a smooth, flexible and yet ever constant traction.

The opposite end of this lever arm, which is underneath the foot of the injured leg, is attached to a U-shaped band, the traction stirrup (j), with perforated holes one-half inch apart. The tongs, pin or wire (k) are connected to this lever by means of special devices. Still other adaptations (h and i) permit of internal or external rotation.

APPLICATION

The technic of application is simple (fig. 3).

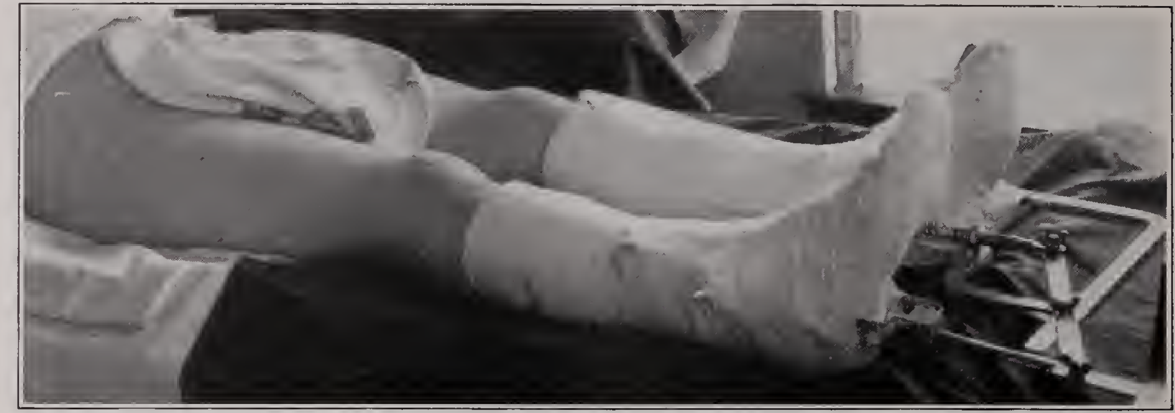

Fig. 4. Fractured neck of right femur (figs. 5 and 6). Skeletal traction obtained by pin through tibia above ankle joint. Cast did not extend to midthigh in this case.

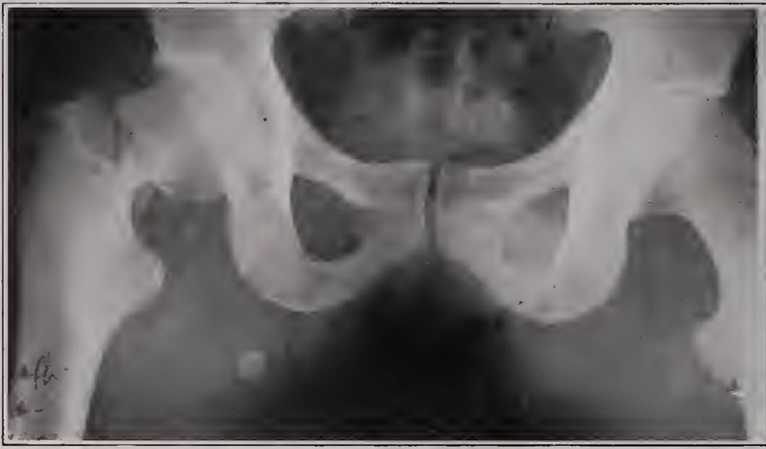

Fig. 5.

Fig. 5. Fractured neck of right femur before reduction.

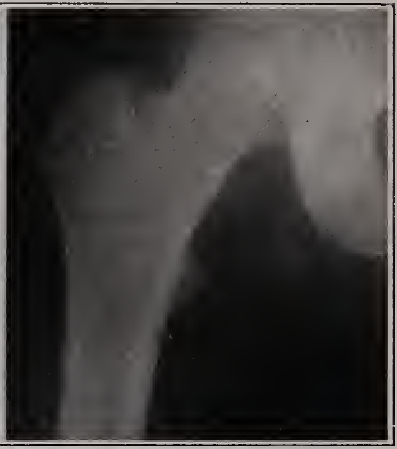

Fig. 6.

Fig. 6. Two weeks after reduction (fig. 4).

First, a well padded plaster of Paris cast is applied to the well leg, extending in most cases from beyond the toe nails to midthigh. The cast usually sets in from five to ten minutes, at which time the stirrup brace is incorporated in the cast by a few turns of a plaster bandage. This stirrup brace is so constructed, and should be so applied, that there will be sufficient room between it and the ankle to permit the later exposure of the condyles.

The next step is the preparation for the insertion of the tongs or pin, which is usually done under local anesthetic. Generally the patient is previously given one-fourth grain of morphine sulphate hypodermically. We then inject the fractured ends with 2 per cent novocaine, according to the method popularized by Böhler, and the site of insertion is similarly injected. In our experience we have had the most success with the use of pins. Although skeletal traction may be applied through the os calcis, through the crest of the tibia, through the condyles of the femur, obliquely through greater trochanter

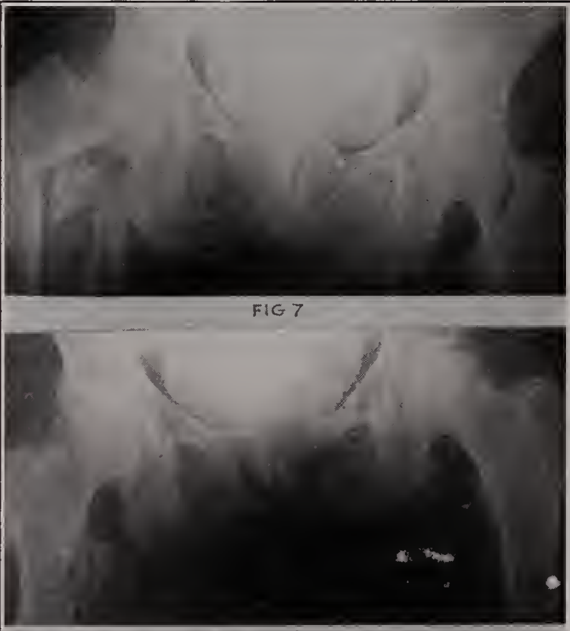

FIG 7

FIG 8

Fig. 7. Comminuted intertrochanteric of right femur before reduction. Fig. 8. After reduction.

or through the crest of the ilium, in the majority of our cases we prefer to apply it at a point just above the malleoli of the tibia or in the lower end of the femur.

The pin, if such is used, is now ready to be connected to the lever arm, but we have found it more practical to apply first a small cast on the injured leg. This incorporates the pin in the cast which extends to about four inches below the knee. In a few minutes after the cast is applied it is firm enough to permit the traction stirrup to be slipped over the ends of the pin, and then the band is firmly fixed in the cast with plaster bandage.

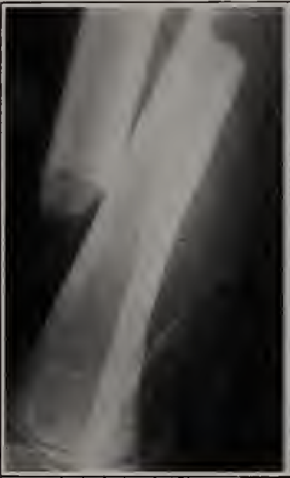

Fig. 9.

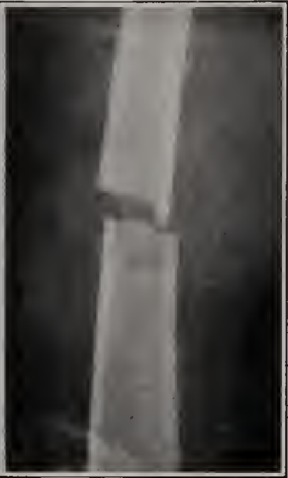

Fig. 10.

Fig. 9. Fractured shaft of left femur with several inches overriding.

Fig. 10. After reduction by transfixion pin above condyles of femur. Note separation due to overtraction (later corrected). Hospitalization only four days.

Now traction can be commenced by turning the nut with the fingers, and by setting the rotation screw the right amount of internal or external rotation can be obtained (fig. 4). When the apparent length and alignment is reached, a roentgenogram is taken and further adjustments made as indicated.

ADVANTAGES

Manifold advantages result from the use of this method not only to the patient but to the doctor as well.

To the doctor. First, the apparatus is simple in its application, in that an orthopedic traction table is uncalled for. In fact, this appliance can be just as effectively used in the bed or roentgen-ray room as in the surgery. Only a few plaster bandages are needed, and the disagreeable general anesthetic with its occasional dangers is unnecessary, thereby avoiding both the calling and the expense of an anesthetist.

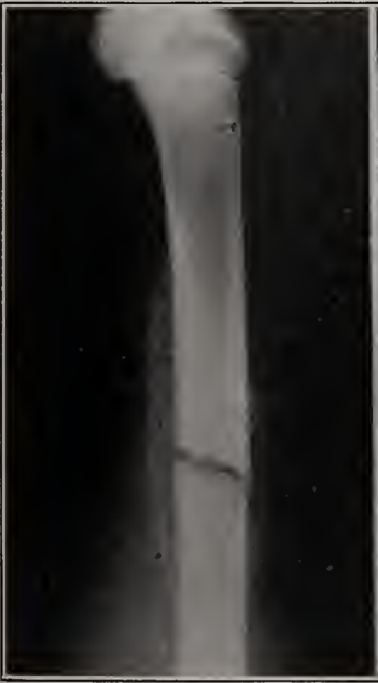

Fig. 11.

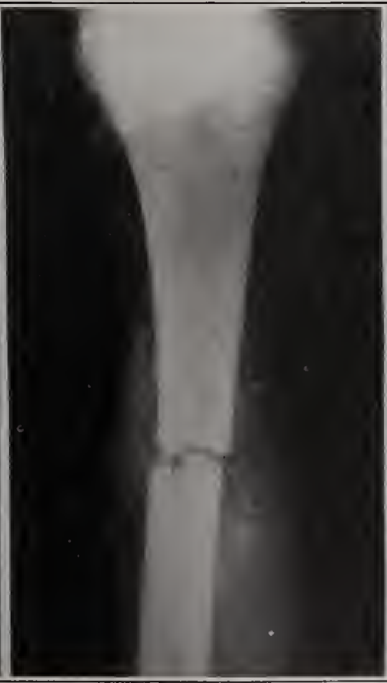

Fig. 12.

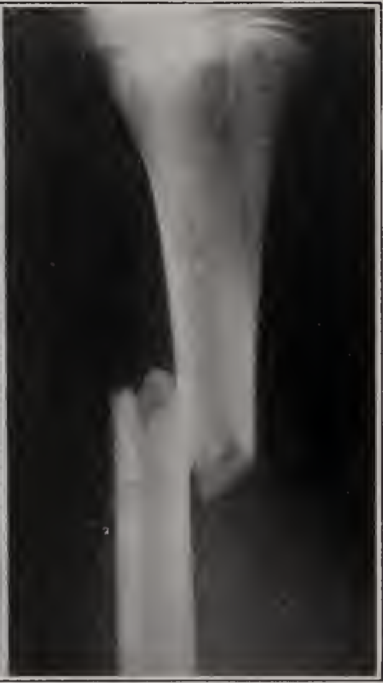

Fig. 13.

Fig. 11. Fractured shaft of left femur before reduction.

Fig. 12. Anteroposterior view. Reduction first obtained by transfixion pin through condyles of femur. First pin broke; second pin put in tibia above ankle joint. Above roentgenogram taken on day of insertion of second pin.

Fig. 13. Lateral view shows overtraction, which was corrected by lessening traction force. Note position of first pin, also large amount of callus and the presence of the normal bow in the femur.

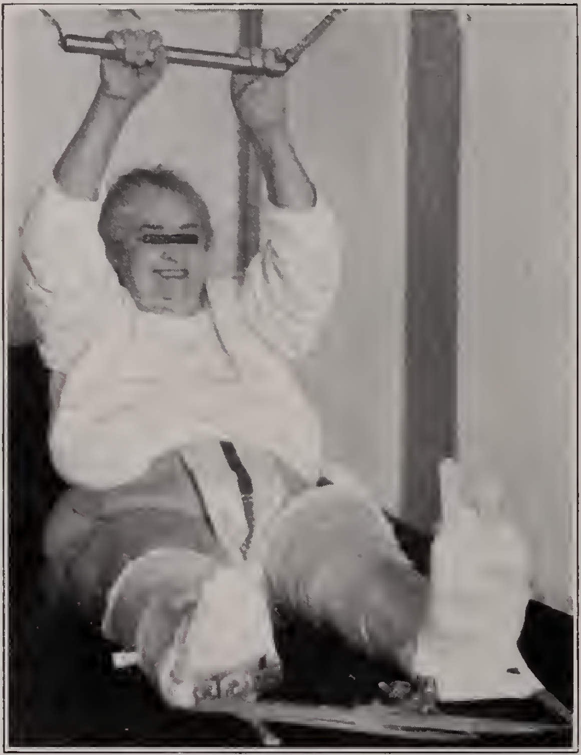
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Fig. 14. Inter and subtrochanteric fracture of right femur. Note difficulties which would have been encountered, had older method of spica cast been attempted. Patient sat up from first day.

Second, the surgeon's time is saved, since there are no ropes or pulleys to slip or become deranged. Once reduction is obtained, no adjustments are necessary, because there is no way for the traction force to change. The fracture can be set immediately, after which very little attention is required, except for an occasional roentgenogram. One of the chief worries of the attending physician is removed when the pin, or whatever is employed, is incorporated in the cast, since this removes all danger of the pin or tongs breaking out or slipping into a joint.

Third, less elaborate hospital equipment is needed. When portable roentgen rays are not available, the patient can be readily moved for examination without disturbing the traction force. When the surgery is not equipped with a traction fracture table, this splint will be found an efficient substitute for such procedure as open reduction or nonunion operations. On the other hand, our apparatus will prove more satisfactory than the traction fracture table, because with our method immobilization means are applied without anesthetic before the operation, whereas with the fracture table it is necessary to apply spica casts and traction under continued anesthetic, following the operation. Our traction force is constant, despite moving the patient, and thus we avoid all mishaps, such as a "slipping by" of the fracture fragments or displacement of the bone graft or pulling out of the bone sutures.

The chief advantages to the patient are three. It decreases the discomforts, decreases the dangers and decreases the expense attendant to fracture of the lower extremities.

The patient is quite comfortable with the splint, and he is even allowed to sit up the same day as the operation, while under older methods of treatment the head must be kept down for countertraction. Thus the dangers of pulmonary and circulatory complications are avoided. The patient is not only permitted to sit up but is encouraged to use a trapeze freely (fig. 14). This peformance enhances his general physical well-being with a resulting increase in circulation, appetite and mental euphoria. Due to this ever constant, nonvarying type of traction, which is attached to neither weight nor pulley, the patient can be moved about on the bed or safely taken on a cart or flat wheelchair to solarium, roentgen-ray room or outdoors.

Since the casts extend beyond the toes, there is no danger from toe or foot-drop or pressure sores from the weight of covers. The injured area is accessible to the benefits and comforts of massage and physical therapy, and since most of the anterior half of the cast may be permanently and safely removed, the whole leg may be so benefited.

A most important direct advantage to the patient, and incidentally to the doctor, is the fact that his stay in the hospital is shortened under this method, as this apparatus permits his safe and easy removal home.

SUMMARY

The advantages of this type of well leg and skeletal traction apparatus are (1) simplicity versus other methods previously devised, (2) ease of application, (3) elaborate hospital equipment unnecessary, (4) complication dangers minimized, (5) better function in less time, (6) shorter hospitalization, (7) comfortable, contented patients.

CRANIOCEREBRAL TRAUMA

IMPLICATING THE SUPERIOR LONGITUDINAL SINUS. FOUR CASE REPORTS *

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Injury to the superior longitudinal sinus or its lacunae, in peace times, is usually due to a depressed fragment of bone. Primary trauma of the dural venous system is relatively uncommon in civil practice. In active military practice the cerebral venous circulation is not uncommonly damaged by gunshot wounds. Velter[1] showed that injuries of the lateral sinus usually prove fatal. Holmes and Sargent[2] found that injuries to the superior longitudinal sinus were relatively less serious. Glancing or tangential (gutter) wounds, crossing the midline of the vault of the skull, oftentimes give rise to vascular disturbances affecting the superior longitudinal sinus and the adjacent paracentral lobules. Many of these wounds are associated with fracture of the inner table. Sharp, direct or glancing blows on the vertex without injury to the skull occasionally produce contusion and edema in the paracentral areas adjacent to the sinus with development of the syndrome of occlusion of the superior longitudinal sinus.

The mechanism of the anatomic arrangement of the veins that enter the superior longitudinal sinus has an important relation to the symptoms produced by injuries in this region. The superior cerebral veins open indirectly into the superior longitudinal sinus (fig. 1), the first opening into the lacunae that project from the sinus over the lateral and mesial surfaces of the cerebral hemispheres. Those lacunae in the parietal region extend more laterally over the cortical areas and on account of their thin wall and compressibility are readily damaged or occluded (fig. 2). A depressed fracture or injury in this region may lead to venous stasis in the return circulation of the upper convolutions.

Injuries involving the superior longitudinal sinus and adjacent cerebral cortex are of interest. First, the syndrome produced by injury in this region is so distinct that there can be little doubt as to the localization; second, the surgical management of injury here requires special means for hemostasis and a knowledge of cerebral anatomy.

Holmes and Sargent[3] were the first to describe the syndrome of vascular occlusion of the superior longitudinal sinus. Their observations were made on clinical material produced by military wounds incident to the World War. This classic neurologic picture of occlusion of the superior longitudinal sinus is dependent on interference with the superior or upper set of cerebral veins, principally those draining the pre- and postcentral gyri. The prominent clinical findings are as follows and may be divided into three main groups: (1) localized motor symptoms, (2) extensor leg rigidity, (3) characteristic sensory phenomena.

The motor symptoms are principally due to injury or venous stasis of the paracentral lobules and the upper part of the midrolandic area. This region is drained chiefly by the upper set of cerebral anastomotic veins. In the order of the rolandic

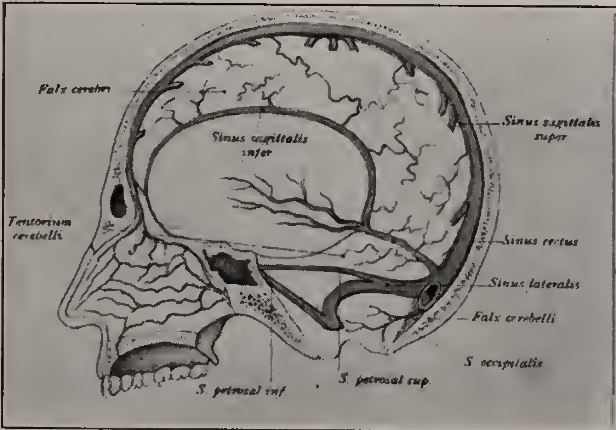

Fig. 1.

Fig. 1. Shows superior longitudinal sinus with communicating veins from cortex (Anatomy of the Brain and Cord—Whitaker).

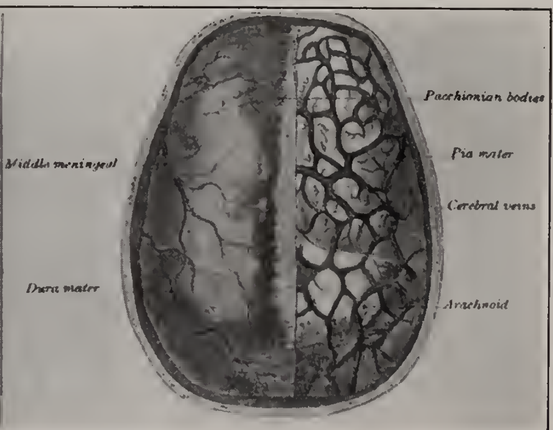

Fig. 2.

Fig. 2. Shows cortical venous system and superior longitudinal sinus (Anatomy of the Brain and Cord—Whitaker).

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* Read before a meeting of Thurston-Mason Counties Society, Shelton, Wash., May 21, 1931.

* Note: Thrombosis or occlusion due to disease is not considered in this presentation.

* Read before a meeting of Thurston-Mason Counties Society, Shelton, Wash., May 21, 1931.

[1] Velter, E.: Plaies du Crane, Paris, 1917.

[2] Holmes, Gordon and Sargent, Percy: Injuries of the Superior Longitudinal Sinus. Brit. Med. Jour., 2:493-498, Jan., 1915.

[3] Ibid: Injuries of Scalp, Longitudinal Sinus. J. Roy. Army M. Corps, 25:56, 1918.

arrangement of the toes, ankle, knee, hip, etc., the involvement of these parts will be affected in this order, the distal part of the extremity being involved more than those parts higher up. The shoulder, elbow and wrist are involved less than the corresponding parts in the lower limbs. The fingers usually escape. The face, being the lowermost part of the precentral area, is likewise rarely affected. In all cases the involvement of the lower limbs will be more noticeable than in the upper extremities.

Spasticity. In lesions involving the superior longitudinal sinus early rigidity of the lower extremities is a prominent symptom. This usually comes on in less than twenty-four hours. It is a characteristic finding. The extent will depend upon the severity of the injury and degree of venous stasis. In some cases it may be so profound that even passive manipulation of the lower limbs is impossible (case 1). Usually the maximum degree of spasticity will be reached within twenty-four hours from onset of the injury.

Removal of the depressed fragment of bone, blood clot or foreign body will frequently be followed by prompt improvement in the spastic paralysis. Even in those cases, where spasticity has been present for a considerable period following the injury, there is little tendency for permanent organic cortical symptoms. Accompanying the early rigidity of the lower limbs there are the usual signs of upper neurone involvement, such as bilateral extensor toe sign, ankle clonus and patellar clonus with exaggerated knee jerks.

Sensory phenomena. These are solely cortical in origin and type. The modalities of pain and thermal sensibility are not involved and there is practically no disturbance in the sense of touch, the principal defect being in the postural, passive movement, joint sensibility and localization of stimuli.

Extensive bilateral injuries or large subdural hematomata may implicate all four limbs. In unilateral lesions the involvement may be greater or less on one side and occasionally hemiplegic in type. In some wounds, posterior to the central sulcus, sensory phenomena only are present. Accompanying this type of injury there is a state of general cerebral arachnoid edema. Usually there is some local damage to the upper part of the hemispheres and a state of increased intracranial pressure may develop, chiefly through edematous changes.

Examination of the eyegrounds often shows a mild edema in the early stages. Later, depending upon the degree of increased intracranial pressure, there will be engorgement of the ophthalmic veins and frank choked disc may sometimes occur. The degree of fundal involvement is entirely dependent upon the duration of the injury and the presence of general edematous cerebral changes. One case (case 1) in this series with complete occlusion of the sinus for forty-eight hours showed no evidence of choking of the discs. Many cases show no sign of disc changes whatever.

The mentality of many of the patients is unusually well preserved, considering the seriousness of the injury. It has been observed that consciousness is rarely lost and most of the patients are able to carry on a normal, coherent conversation, although they are in general in a state of drowsiness.

During the World war a high mortality followed operative treatment in this type of injury. Makin's statistics give a mortality rate of 38 per cent among 39 operative cases and one-half of one per cent among 37 nonoperative cases.[4] The high mortality in this type of injury is principally due to the serious, at times uncontrollable hemorrhage, too early surgical intervention and operations without adequate means for control of bleeding.[5] The management of each case is individual, depending upon the nature of the wound. In compound wounds careful debridement of hopelessly damaged brain substance, dura, bone or scalp is imperative in order to prevent wound infection and meningitis.[6] The use of suction to remove small fragments of bone and brain detritus is helpful.

The type of incision in the approach to the superior longitudinal sinus depends largely upon the location and extent of the injury. The Isle of Man or tripod incision is favored by some surgeons. An incision from ear to ear with median slit forward or backward is sometimes useful and occasionally a double flap may be necessary, although this has some disadvantages as the upper margins of the flap may be deprived of sufficient blood supply and healing may be delayed.[7]

The following cases are considered of sufficient interest to warrant a detailed repetition of each case report.

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[4] Makins: Manual of Neurosurgery, U. S. A., p. 168.

[5] Ferrarini, G.: Treatment of Wounds of the Superior Longitudinal Sinus in Cranial Fractures. Policlinico (sez. prat.), 37:90-92, Jan. 20, 1930.

[6] Soar, H. M.: Fracture of Skull with Wound of the Superior Longitudinal Sinus. Suggestions for Treatment. West African M. J., 2:186, Apr., 1929.

[7] Bailey, P.: Wounds of the Superior Longitudinal Sinus. Surg. Clin. N. A., 9:395-405, Apr., 1929.

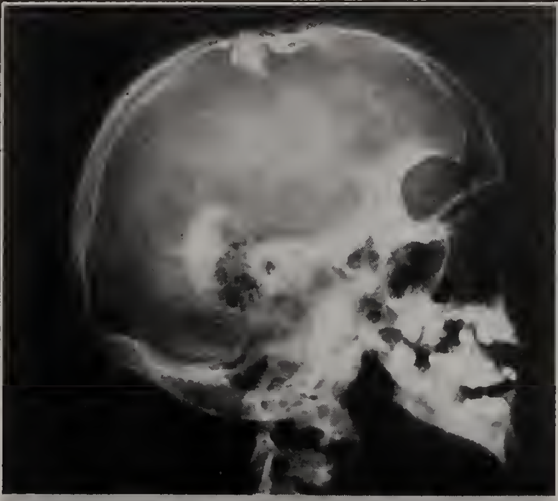

FIG 3

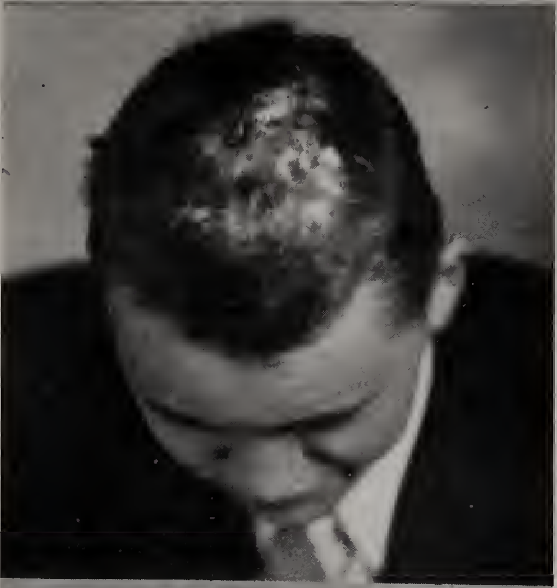

FIG 4

Fig. 3. Craniogram showing depressed fragments of vault of skull. Large fragment lacerating and plugging rent in superior longitudinal sinus.

Fig. 4. Photograph of healing wounds involving vault of cranium. Severe injury to superior longitudinal sinus.

Case 1. Consultation with Drs. Gage and Kennedy at Shelton General Hospital.

J. P., age 21 years, occupation clerk.

History. On December 11, 1930, while driving his motor car he skidded off an ice covered highway and fell into a canyon, a distance of fifty feet, striking the top of his head on a pile of rocks. He was not unconscious and remained in this position for ten hours until he was picked up by a passing motorist and taken to the Shelton General Hospital.

Examination. Patient was slightly drowsy but able to converse intelligently. The vault of the skull presented a large bulging mass of clotted blood and brain substance. A fragment of bone was observed protruding perpendicularly from the center of the wound. There was a semicircular flap of scalp detached posteriorly over the occipital region.

Neurologic examination presented a typical longitudinal sinus syndrome. The lower extremities were in intense spastic rigidity and passively moved with difficulty. There were bilateral Babinski, Oppenheim and Gordon and a double ankleclonus and loss of postural and joint sensibility in the lower extremities. Abdominal reflexes were absent. Some spasticity of the arms and impairment of joint sensibility in the fingers was also present. The eyegrounds showed mild venous engorgement. The pupils were of equal size and the left eye turned in slightly. Roentgenogram showed a comminuted depressed fracture of the vault of the skull with one large fragment projecting into the intracranial cavity exactly in the midline (fig. 3).

Surgical intervention was deferred until January 12, 1931, on account of the danger of hemorrhage and shock.

Operation. Under 1 per cent novocain block of the trigemini and local infiltration the area was exposed with the tripod incision and complete debridement of the lacerated scalp margins carried out. A quantity of macerated brain substance was removed by irrigation and suction. Many small fragments of bone were removed and the wound thoroughly cleansed of hair and other foreign materials and a thorough toilet of the area carried out. A large fragment of bone projecting inwards had been purposely left in place until the field was clean.

In the meantime, Dr. Kennedy prepared and removed a section of muscle from the right leg. The large fragment of bone was then removed. There was an immediate profuse hemorrhage from the sinus which had been completely torn across and bleeding merely checked by the clot and the continual pressure of the bone plug. The muscle was implanted over the torn sinus and held in place, and the wound closed in layers with a small rubber drain at each end of the incision.

Other than for a mild wound infection, convalescence was uneventful.

The neurologic examination at this time shows no evidence of a superior longitudinal sinus involvement and the wound is healed (fig. 4).

Case 2. Consultation with Dr. P. C. Irwin at Providence Hospital, Seattle.

C. J., white male 24 years of age, married, occupation clerk.

History. On August 12, 1930, while riding in an automobile with a party of friends, was in collision with a street car. He was thrown out, striking his head on the curbing and was brought to Providence Hospital about 10 p.m. in an unconscious condition, suffering from a moderate state of shock. There were multiple lacerated wounds of the face and scalp, a large lacerated wound of the right arm and several body bruises. A large compound wound of the frontal region was also observed, from which exuded brain substance and venous blood.

Examination. The neurologic examination presented a strong bilateral Babinski sign and spastic lower extremities. Roentgen examination showed a large depressed fracture of the frontal bone which also involved the right frontal sinus. There was also a large depressed fracture of the right temporal region (fig. 5). His condition remained precarious and surgery was withheld until August 14.

Operation. On August 14, after careful preparation of the scalp and under novocain, 1 per cent block of the trigemini, a large frontal flap was turned down. The right half of the frontal bone was unlocked from the overriding fragments and elevated. The fracture was comminuted and several small fragments were removed. The dura

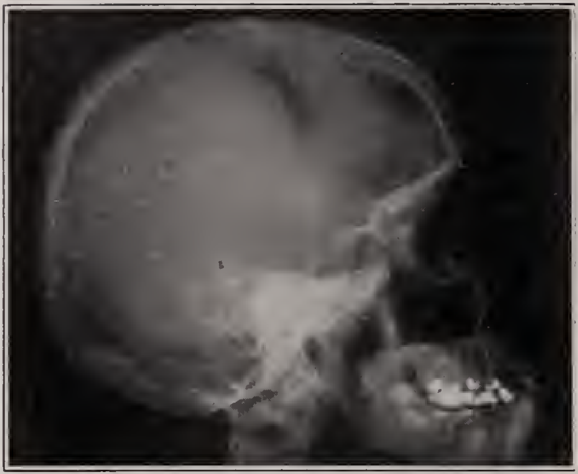

Fig. 5. Craniogram showing multiple depressed fractures of frontal and temporal regions. Injury to superior longitudinal sinus.

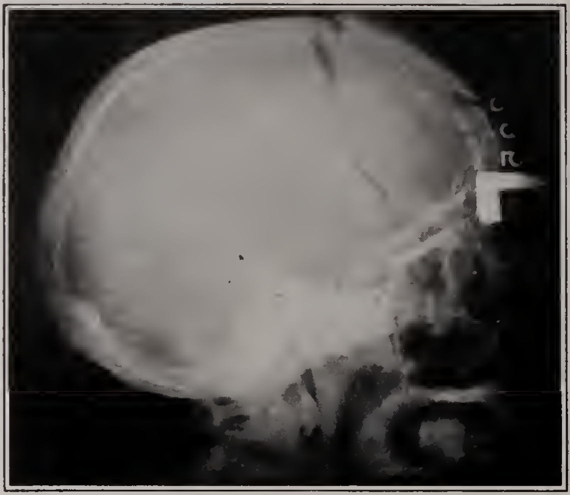

Fig. 6. Craniogram showing compression fracture of vault with laceration of superior longitudinal sinus.

was torn and had involved the wall of the longitudinal sinus. A large hematoma had formed over the frontal lobe. There was free bleeding from the sinus. This was stopped with muscle grafts and a subcortical hematoma the size of a pullet egg was removed from the right frontal lobe. The depressed fragment in the temporal region was likewise elevated, both depressed fragments replaced in position and the wound closed without drainage except for a stab wound drain over the right frontal sinus with a glycerine and iodine gauze pack.

During the procedure, which consumed about two and a half hours, the patient's mental condition improved. He carried on a conversation with the operator and on removal of the hematoma from the frontal lobe there was a remarkable clearing in his mental condition.

Following the operation the urine showed 12 per cent sugar and a strong trace of albumin. Sutures were removed on the fourth postoperative day and the wound healed without any signs of infection.

At the present time there is no evidence of longitudinal sinus involvement. There is, however, a mild ptosis of the right lid and a right trigeminal hypesthesia and hypalgesia.

Case 3. Consultation with Dr. Montgomery Russell at Providence Hospital August 26, 1931.

J. P., white male, single, occupation warehouse foreman.

History. On the evening of August 25, 1930, while at work, in some unknown manner his head was caught between two freight cars and compressed. He was brought to Providence Hospital suffering from severe hemorrhage and moderate shock.

Examination. He was in some stupor, yet he could carry on a rational conversation and related that his head became caught between two cars which were thrown together. He distinctly felt his skull "cracking." His lower extremities were mildly spastic and there was a double Babinski sign. There was a lacerated wound in the right side of the head about six inches in length and marked edema of the eyes with ecchymosis and clotted blood in both nostrils. Some sagging of the lower half of the mouth on the left side was also observed.

Roentgenograms of the skull showed a fracture running transversely, following in a general line the coronal suture, crossing from side to side and extending into the frontal region with overriding of the frontal bone (fig. 6).

Under vigorous treatment he recovered from shock and on the following day, August 27, was taken to the surgery.

Operation. The scalp was prepared, infiltrated and blocked with 1 per cent novocaine and a double frontal flap incision made, releasing a large subgaleal hematoma. A trephine opening was made on each side of the midline just back of the fracture, and the bone carefully rongeured away from over the superior longitudinal sinus, unlocking the frontal depressed rim of the fracture. There was a large extradural hematoma about three-fourths of an inch in thickness, extending over the entire right frontal and temporal regions. This was evacuated and a small hematoma was left over a tear in the superior longitudinal sinus just anterior to the line of fracture. There was bleeding from a tear in the lateral wall of the sinus which was controlled with two silver clips and muscle graft. Several large, oozing venous lacunae entering the sinus were closed with silver clips and muscle. The skull had been compressed from side to side with a narrowing of the intertemporal axis. Therefore, it was impossible to completely reduce the fracture. The wound was closed without drainage and recovery was uneventful.

Case 4. J. M., age 38 years, single, occupation pipe fitter. This patient was referred from the first aid station of the Rock Island dam at Wenatchee.

History. On December 14, 1930, while working in a metallic compartment, a large wrench fell a distance of twenty feet, striking him on the head exactly in the midline and knocking him down but not rendering him unconscious, although he was dazed. The scalp was dressed. He did not return to work.

He was seen on the third day following his injury, complaining of violent headaches, vertigo and a sense of pressure on the top of his head.

Examination. Showed a hematoma the size of a lemon in the vertex. The lower extremities were weak and there was a disturbance in postural sensibility in the toes and exaggeration of the deep reflexes. The plantars were hyperactive and both hands showed a disturbed postural sensibility.

A lumbar puncture was performed. The pressure was 14 mm. with patient lying quietly on his side. The fluid was amber colored. Roentgenogram was negative for fracture.

This evidently was a case of cerebral arachnoid edema, centering about the upper rolandic region.

Under conservative treatment with repeated drainage by lumbar puncture and dehydration his condition slowly improved. He still complains of some headaches and dizziness.

These cases all show a definite localization of intracranial damage in the region of the upper motor and sensory areas drained by the superior longitudinal sinus.

SUMMARY

The subject of cranial injuries involving the superior longitudinal sinus and the adjacent rolandic areas of the cerebral cortex is considered. The neurologic syndrome first described by Holmes and Sargent is briefly reviewed. A resume of the surgical principles involved in the management of these cases is described and four cases of injury involving the superior longitudinal sinus are presented.

CONCLUSIONS

1. Injury to the superior longitudinal sinus in peace times is infrequent.

2. The neurologic findings are distinct and the localization accurate.

3. Surgery should be delayed and treatment for shock given priority. When hemorrhage is uncontrollable then only is immediate operation advisable.

4. Special types of incision for the approach to the superior longitudinal sinus are necessary and appliances for hemostasis, anticipating severe bleeding, should always be available before operation is undertaken.

5. Complete recovery may be expected from the objective neurologic standpoint.

Medical-Dental Building.

THE DIAGNOSIS AND MANAGEMENT OF CRANIOCEREBRAL INJURIES*

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The increasing incidence of traumatic craniocerebral lesions and the unfortunate results that may follow improper management serve to impress upon our minds the importance of accurate diagnoses and judicious treatment in the handling of all patients with cranial trauma. For this reason it would seem that a discussion of the problems connected with the management of injuries of this type is well justified.

In the past the severity of an injury to the cranium was judged largely by the presence or absence of a skull fracture and too little attention was paid to the associated intracranial damage.[1,2] The methods of treatment were usually directed toward the correction of bony injury. More recently, however, the trauma to the brain and its coverings have been given more consideration, and we have learned through experience that a physiologic readjustment of the involved nervous tissues is the important thing after all. This does not mean that breaks or depressions in the cranial vault should not be properly attended to, but that at the same time the degree of intracranial involvement should be carefully evaluated and the treatment carried out accordingly.

Experience in dealing with craniocerebral injuries has taught us that all patients who present themselves with trauma to the head do not fall into the same group as far as treatment is concerned. The injury in many instances may be very slight and require only temporary therapeutic measures. Again, the injury may be so severe that any method of treatment would prove ineffectual. For that reason I have thought it advisable to arrange some form of a classification[3] in order to be able to deal with the various types separately.

CLASSIFICATION

1. Scalp abrasions without laceration and without skull fracture.
2. Scalp lacerations without skull fracture.
3. Skull fracture without symptoms of intracranial injury and without depression.
4. Skull fracture with symptoms of intracranial injury, with or without depression.

In addition to these four main types we might include others, such as (1) intracranial injury without external evidence of trauma, or (2) intracranial injury without skull fracture, with or without external evidence of trauma. These, however, while not infrequently seen, are not as common as the rest, and a detailed discussion of them will be omitted. It is sufficient to say that, upon the recognition of brain damage when external evidence of violence is absent, careful examinations and observations, as described later, will indicate the proper method of treatment to be carried out.

SCALP ABRASIONS WITHOUT LACERATION, WITHOUT SKULL FRACTURE

Injuries of this type are the ones which are perhaps the most frequently seen, and in many instances we content ourselves with merely cleansing the skin and applying a small antiseptic dressing. At times they are dismissed without any treatment at all. On account of the possibility of overlooking an obscure skull fracture or intracranial involvement, it is far better, in my opinion, to examine these patients thoroughly before administering final treatment. A careful general and neurologic examination should be made as soon as the patient is first seen, and arrangements made for further examinations and observation. I believe that roentgenograms of the skull should be taken routinely in all head injuries. Also, because we are dealing with potentially infected wounds in these cases, it is best to give a prophylactic dose of five hundred to fifteen hundred units of tetanus antitoxin as a precautionary measure.[4] Examination of the spinal fluid should be made if intrancranial injury is suspected. Moreover, before dismissing the patient from our care, it is advisable to inform him or his relatives of the possibility of further trouble. Objection may be made to this on account of the chance of encouraging a posttraumatic neurosis, but if carefully handled, a complication of that nature will be avoided. It is more important, I believe, to protect ourselves against future embarrassment, which is apt to occur if we do not guard the prognosis in each case.

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* Read before a meeting of Larimer County Medical Society, Fort Collins, Colorado, May 4, 1931.

[1] Craig, W. McK.: Head Injuries. Minn. Med., 14:131-134, Februray, 1931.

[2] Ibid: Rochester, Minn. Personal communication.

[3] Bunten, W. Andrew: Head Injuries. J. Mich. State Med. Soc., 29:889-895, December, 1930.

SCALP LACERATIONS WITHOUT SKULL FRACTURE

Like the preceding ones, there are several possibilities in these cases. On account of the open wound we are not liable to dismiss the case so lightly, although frequently the patient is discharged after cleansing the wound, suturing and dressing. Inasmuch as these may also represent a part of that group with delayed symptoms, it is much better to treat them as such than to let them go before those symptoms develop. For that reason we examine these patients very carefully in the following manner.

After excessive bleeding from the wound has been temporarily controlled, roentgenograms of the head are taken and a general and neurologic examination made. When the presence of a fracture has been definitely ruled out and the results of all other examinations and tests are negative, the wound is then repaired. This may be done in various ways according to the wishes of the surgeon, although observance of the following rules is recommended: (1) That the wound edges are carefully shaved and the surrounding skin cleansed with an effective antiseptic solution; (2) that all foreign material and devitalized tissues have been completely removed; (3) that the inside of the wound has been thoroughly washed with tincture of iodine or some equally powerful antiseptic; (4) that the open ends of all severed vessels have been securely tied, and (5) that the wound is closed with ample drainage, either by the insertion of a competent drain, or the placing of interrupted sutures far enough apart to allow free seepage between them.

While some surgeons might prefer complete closure and no drainage, I feel that the danger of secondary infection from the exterior is far less than that with forced retention of potentially infected material within the wound. On account of the extreme vascularity of the scalp and the anatomic relationship of the covering structures to the skull, free drainage from traumatic wounds in this area is desirable. The application of a tight bandage after closure of the scalp will usually void hematoma formation. After surgical repair has been effected, the usual dose of tetanus antitoxin should be given, and the patient allowed to remain under observation for a period of several days. If no unusual symptoms develop and the wound heals satisfactorily, the patient may then be dismissed.

SKULL FRACTURE WITHOUT SYMPTOMS, WITHOUT DEPRESSION

The general mode of attack in these cases is the same as that for injuries to the scalp alone, excessive bleeding from the wounds being first controlled, followed by routine roentgenography, general and neurologic examinations. As soon as the roentgenographic report has been received and the presence of a fracture demonstrated, a lumbar puncture should then be done to determine the condition of the cerebrospinal fluid. If the fluid is not under increased pressure and free from blood, and there are no demonstrable neurologic signs as well as no areas of definite depression in the skull, repair of the scalp may then be carried out in the same manner as previously described. On account of the presence of the fracture these patients should be watched closely for a period of twelve to twenty-four hours, and should remain in the hospital from ten days to two weeks. Following this, if no unusual symptoms have developed, they may be allowed to go home. At the same time, a period of rest at home should be advised and they should be cautioned against excessive stooping, straining and heavy lifting. They may be permitted to return to their work after six to eight weeks, depending upon the nature of their employment, or the development of subsequent symptoms. If compression signs are noted at any time after the injury, further treatment is indicated. On the other hand, if bloody spinal fluid is encountered upon lumbar puncture, the institution of daily spinal drainage with limitation of fluids, as advocated by Fay,[5] is suggested. This will be discussed in more detail under fractures with intracranial injury.

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[4] Adson, Alfred W., Rochester, Minn. Personal communication.

SKULL FRACTURE WITH SYMPTOMS OF INTRACRANIAL INJURY

It is in this group of cases where the outlook is somewhat uncertain and careful management is very important. We will, therefore, discuss the symptoms, diagnosis and treatment separately.

Symptoms. Any or all of the following signs and symptoms may be present in a patient with severe craniocerebral injury, and their presence or absence should be determined in every case.

1. A disturbance of mentality or consciousness, in which the patient may be extremely restless, disoriented, confused, drowsy, stuporous or comatose. It has been said that the usual sequence of events is, first, a period of temporary stupor or coma, followed by a so-called lucid interval, when the mental picture is often quite normal, and later, a second attack of unconsciousness from which the patient may or may not recover. However, various types of mental reaction as well as combinations of them may be present at any time. The early mental change is frequently due to the shock from the injury, while the later mental status is probably associated with irritation and pressure.

2. Headache, usually severe, not always well localized, continuous or paroxysmal and with or without emesis. The early vomiting is doubtless produced by the shock of the blow itself, while later it may be indicative of increasing intracranial pressure. If the vomiting is of the projectile type, the latter condition should be suspected. According to Fay, if spinal drainage and dehydration has been effected at the time of the injury, the so-called postraumatic headache, which develops after days or weeks, may be avoided. The absorption of devitalized brain tissue and blood as well as a disturbance of the normal absorption and circulation of the cerebrospinal fluid must be seriously considered as causative factors in their production.

3. Active bleeding or evidence of bleeding from the eyes, ears, nose or mouth. This is usually associated with fracture at the base of the skull, with involvement of the middle meningeal or carotid arteries, or circle of Willis; or with laceration of the intracranial venous sinuses. In the former case the sudden onset and rapid progression of symptoms, particularly acute when the internal carotid is torn, is indicative of arterial bleeding, while in the latter, the slower progress of compression will suggest to us venous bleeding. On the other hand, hemorrhage coming directly from any one of the larger dural sinuses may follow a course just as rapid as bleeding from a severed cerebral artery. At the present time there seems to be a growing tendency toward the belief that venous lacerations following cranial trauma are much more frequent than actual arterial tears. In any event, the presence of additional damage to the throat or the organs of the chest or abdomen must be considered before the real significance of bleeding from the mouth or nose alone can be determined.

4. Drainage of cerebrospinal fluid through the nose, mouth or ears, which may or may not be associated with hemorrhage. This would indicate a fracture at the base with extension into the subarachnoid space. In fractures of the anterior fossa the cribriform plate of the ethmoid is usually involved, while in middle fossa injuries communication to the exterior is brought about by the extension of the bony break into the cavities of the ear through the petrous portion of the temporal bone. The presence of clear fluid in the external auditory canal does not necessarily mean that we are dealing with subarachnoid drainage until a chemical analysis has shown that it is not perilymph. However, it is far safer to consider it to be the former until proven to be the latter.

5. Abrasions, contusions and lacerations of the scalp, with active bleeding or hematoma formation. While one or more of these is usually present, a fracture of the skull with severe intracranial injury may occur without any external evidence of trauma.

6. Depressions of the skull, as determined by inspection, palpation and roentgenograms, and which in some instances may be masked by an overlying hematoma.

7. Edema, as well as hemorrhage, within the structures of the orbit, with ptosis or proptosis of one or both eyelids. It is often difficult to determine at the outset whether this is due to blood or spinal fluid, or both, but the possibility of its

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[5] Fay, Temple: Generalized Pressure Atrophy of the Brain Secondary to Traumatic and Pathologic Involvement of the Pacchyonian Bodies. J. A. M. A., 90:245-249, January 25, 1930.

being the latter must always be kept in mind, particularly if a fracture of the orbital cavity is demonstrable.

8. Subcutaneous emphysema of the face and scalp. Fracture of the accessory nasal sinuses may be responsible for this condition, although the chest should be carefully examined to elminate injury to the bronchial tree before deciding just what is the cause of the presence of air in the tissues.

9. Anesthesia or paralysis of one or more of the extremities. This is usually noted on the side opposite to the injury, although contracoup injuries may take place, in which ipsolateral signs may be present. Pressure over the cortex or destruction within the brain itself will account for these symptoms. On the other hand, local trauma to the extremities must be taken into consideration before coming to the conclusion that the trouble is due entirely to intracranial damage.

10. The presence of aphasia, early or late, partial or complete, indicating pressure upon or destruction to Broca's area in the inferior frontal convolution. It is quite universally accepted that this center is located on the left side in right-handed individuals and on the right side in left-handed individuals, although there is still some controversy on this point. The presence of a bilateral speech center has been suggested by Marie, and experimental evidence given in support of his opinion. Along with other signs its location is easily established, which is extremely helpful in determining the site of the lesion in the brain.

11. Involvement of several cranial nerves, as shown by a disturbance in the sense of smell, limitation of motion of the eyes, facial weakness, auditory manifestations, inability to masticate or swallow properly and so forth. In Swift's[6] series involvement of the cranial nerves, outside of the fundus findings, was not considered of great importance, although in some of the cases I have seen massive cranial nerve pressure was quite evident, suggesting fracture at the base of the skull and basal hemorrhage.

12. Changes in the deep reflexes, with or without the presence of pyramidal tract signs. Often, in the earlier stages, the only indication of involvement of the extremities will be a substantial increase in the patellar and achilles response, with a positive Babinski sign, or an increased excursion of the biceps reflex with a positive Hoffman. However, even with intracranial hemorrhage or destruction, a flaccid monoplegia or hemiplegia may be present.

13. Jacksonian epileptic attacks, indicating irritation of the motor or sensory cortex, depending upon whether the irritative phenomena are motor or sensory in character. These may occur early in connection with the injury itself, or appear later on in association with the development and progression of a complicating intracranial process.

14. Abnormal pupillary reactions. It has been said in the past that the so-called Hutchinson's (dilated) pupil, due to direct third nerve pressure at the base, should be found on the side of the injury to the brain.[7] On the other hand, it is not uncommon to find a constricted pupil on the side of the lesion in the early stages, while later on it may become dilated and immobile. Moreover, it is not at all unusual to have no pupillary change, or bilaterally dilated or constricted pupils at any time after the injury. Therefore, we cannot always rely on the pupillary phenomena as being an index to the affected side of the brain.

15. Edema of the optic discs with engorgement of the retinal vessels, with or without retinal hemorrhages. The choking of the discs is usually a late manifestation, occurring after from twelve to thirty-six hours, and is quite indicative of increased intracranial pressure or local pressure on the optic nerve. Retinal hemorrhages may be found associated with the papilledema, or may be present independently as a direct result of the injury. In the latter case their presence will be noted early.

16. Bloody cerebrospinal fluid on lumbar puncture. When this is found, hemorrhage into the subarachnoid space and ventricular system of the brain has occurred, provided the spinal cord and its membranes have not been injured, and may be due to trauma to the brain itself. A series of punctures in connection with spinal drainage will eliminate the possibility of local damage to a dural vessel at the site of the puncture.

17. Fluctuation of the blood pressure, pulse, pulse pressure, temperature and respirations. All variations of these occur, from the early stage of shock with low blood pressure, slow pulse, subnormal temperature and slow, deep labored respirations, through the stage of reaction with rising blood pressure, increased pulse, elevation of temperature and increased respirations, to the terminal stage in fatal cases of low blood pressure, rapid pulse, extremely high temperature and rapid, la-

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[6] Swift, George W.: Head Injuries of Moderate Degree. North. Med., 30:16-18, January, 1931.

[7] Roberts and Kelly: Textbook on Fractures. J. B. Lippincott Co., Philadelphia.

bored, irregular breathing. The latter picture is one to be avoided, and upon the presence of persistent elevation of blood pressure and pulse pressure, treatment, whether medical or surgical, should be instituted at once.[8]

Diagnosis. The diagnosis of a skull fracture with intracranial injury is not always easily made, and particularly of intracranial injury without skull fracture. Many symptoms and signs which are present here may be found in other conditions. For example, the period of coma due to concussion or compression may simulate that found in acute alcoholism, diabetes, uremia, apoplexy, epilepsy, opium poisoning or even brain tumor. Furthermore, the paralysis, anesthesia, aphasia and so forth might easily point toward spontaneous hemorrhage within the skull associated with vascular disease. However, with a history of severe trauma to the head or a terrific fall in which the patient was terribly shaken; with the drainage of cerebrospinal fluid or blood from the ears, nose or mouth; together with roentgenographic evidence of a fracture of the skull, very little difficulty should be had in making the proper diagnosis. In the absence of definite symptoms of intracranial injury in the beginning, and with the presence of only a few suggestive ones, extreme care must be taken that a serious injury is not overlooked. It is far better, I believe, to be overcautious in handling a minor scalp abrasion than to overlook the dangers associated with a fractured skull.

TREATMENT

There are many methods of treating fractures of the skull with intracranial injury and most of them possess a great deal of merit. At the present time opinions are divided as to just when and when not to operate, and the general trend seems to be away from early surgery and toward dehydration with limitation of the fluid intake. Nevertheless, with all of our recent advancements we cannot get away from the fact that surgery has its definite place.

Peet's[9] contribution in the use of hypertonic glucose has added greatly toward the efficacy of medical management. The work of Craig and Flothow[10] at the Mayo Clinic in attempting to establish the proper dosage, concentration and time interval of administration of intravenous glucose has also proven extremely helpful. By the use of dehydration methods, limitation of fluids and spinal drainage, Fay and his coworkers have reported excellent results in the treatment of craniocerebral injuries. The experimental work of Naffziger and Glaser[11] on the effects produced by depressed fractures has shown that it is probably not necessary to elevate simple depressions. However, I feel that the operation itself is not of sufficient magnitude to contraindicate its use where a depression of considerable size exists. I am also convinced that no hard and fast rule can be made for the management of skull injuries as a whole, but that the progress of each case is the controlling factor, in most instances, of the type of treatments to be used. On the other hand, it is well to have a fairly systematic routine which may be applied to most cases in order that too much time is not lost in attempting to decide what to do. To this end the following suggestions are offered in the hope that they may prove beneficial in handling some of the various problems that may be encountered.

If the patient is first seen in a condition of shock, the usual treatment of this condition should be carried out, such as absolute quiet and rest in bed, with opiates if necessary; the application of heat externally; the administration of cardiac and respiratory stimulants when needed; the subcutaneous injection of fluids and so forth. If an unusual amount of blood has been lost, a blood transfusion combined with stimulation is in order. These, however, are used only as emergency measures, and the routine examinations and tests should go on without delay as soon as the patient's condition will warrant it. This is somewhat at variance with some of the ideas recently expressed by other men, but I feel that it is always best to obtain all necessary data as soon as it is reasonably safe, in order to carry out whatever treatment is advisable, whether medical or surgical, or both for the control of the cranial injury.

If a large hematoma of the scalp is present, with or without skull fracture and without a depression of major importance, and if the results of the neurologic examination do not reveal signs of local compression, whether the spinal puncture shows blood in the fluid or not, I believe it is best to follow the course of conservative management and delay operative procedures until more definitely indicated. In this case the patient should be placed flat in bed and treated as follows: (1) The fluid intake should be restricted to less than 1,000 cc. daily, including all nourishment or fluids given by mouth, by intravenous route, subcutaneously or by rectum; (2) dehydration should be effected, first, by the use of a hypertonic diet, consisting of orange juice, grape juice, ginger ale, tea, broth, milk, candy and so forth; second, by the intravenous injection of hypertonic glucose, 250 cc. of twenty per cent or 50 to 100 cc. of fifty per cent, depending upon the rapidity of dehydration and amount of fluid desired, and, last, proctocylsis of ten per cent glucose, alternated with retention enemas of two ounces of magnesium sulphate in four ounces of water; (3) spinal drainage should be instituted daily and fluid in amounts of 30 to 50 cc. removed at each sitting, attempting to keep the intraspinal pressure within normal limits (if bloody cerebrospinal fluid is encountered, drainage should be continued daily until the fluid is clear); (4) medication by mouth in the form of acetylsalicylic acid, pyramidon and codeine may be given at regular intervals of three to four hours for headache and restlessness, combined with the hypodermic injection of codeine, if oral administration fails or is not practical; and (5) after the expiration of the twelve to twenty-four hours, when clotting should have occurred, aspiration of the hematoma under strict aseptic precautions is advisable. This may be repeated as often as necessary until the scalp remains flat.

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[8] Learmonth, J. R.: Rochester, Minn. Personal communication.

[9] Peet, Max M.: Treatment of Cranial and Intracranial Injuries. J. Mich. State Med. Soc., 26:16-19, January, 1927.

[10] Craig, W. McK., and Flothow, Paul G.: Unpublished Data of Work Done at Mayo Clinic.

[11] Naffziger, Howard C., and Glaser, Mark Albert: An Experimental Study of Depressed Fractures of the Skull. S. G. and O., 51:17-30, July, 1930.

This regime should be continued over a period of from one to two weeks, at the same time watching closely for any indication of compression signs, in which case operation should be considered. After all symptoms have disappeared, the measures of treatment may gradually be replaced by a normal routine and the patient sent home for the remainder of the convalescence. At the same time it is wise to direct all subsequent activity for the next few weeks or months, and to be on the lookout for a return of symptoms.

In the presence of an extensive depression in the skull, in which the inner table is misplaced inward to a considerable depth or over a large area, exploration of the fracture with elevation of the fragments and debridement is usually advisable. The presence of focal signs in a fracture of this type makes operation almost a necessity. Exploration of the area involved may be carried out in one of two ways; (1) through the original laceration, if one exists, enlarged and extended to give ample exposure; or (2) through a separate incision made at a convenient point near the border of the depression. The individual case will determine the method of choice. All depressed fragments should be slowly and carefully elevated, which is usually accomplished by the use of an elevator passed under the bone from a burr hole made in the healthy bone near the border of the depression; devitalized tissue and foreign material should be gently and carefully removed, and after ligating all visible bleeding points within the skull, closure made as in simple laceration of the scalp. Excessive manipulation of the brain and its coverings should always be avoided.

In the absence of a depression of major importance, if we have reason to believe that compression is developing in the middle or anterior fossae of the skull (the most serious of which is arterial or large sinus bleeding), and which does not respond to dehydration and drainage, exploration may be made through the so-called points of election in the frontotemporal and postparietal areas[12]. If the internal carotid has been torn, death will have occurred from acute intracranial pressure before an operation of any sort could have been performed. On the other hand, if the middle meningeal artery has been injured, which is said to occur frequently, where the anterior branch passes upward at the junction of the greater wing of the sphenoid and the anteroinferior angle of the parietal bone, and where often a distinct bony canal is formed, an approach through this area would be desirable. It has been demonstrated that this area is located on the exterior of the skull at a point one and one-half inches behind and one inch above the zygomatic process of the frontal bone. Therefore, a vertical incision, inclining slightly forward, made over this point for a distance of two to three inches, with subsequent trephing of the skull beneath, would allow us not only to explore the anterior branch, but in addition to determine the presence or absence of extradural or intradural bleeding.

Furthermore, by simply enlarging the incision and the opening in the bone, we could examine the posterior branch as well as the main trunk of the artery itself. If further exploration of the posterior branch is desired, an additional incision could be made in the postparietal area over a point which is represented externally by the junction of a line extended posteriorly from the supraorbital ridge, known as the supraorbital line, and one directed upward from the posterior border of the mastoid process. If a break in the artery is found in either location, it may easily be ligated or closed with a silver slip. If, however, the walls of the artery are intact throughout, and no bleeding is seen either outside or inside of the dura mater, no further exploration is necessary. On the other hand, whether the artery is intact or not, if the presence of extradural or intradural hemorrhage is established, further surgery is warranted. This may be accomplished by turning down a large osteoplastic flap over the frontoparietotemporal area, using the previous incisions as the anterior and posterior limbs of the flap, or by utilizing the original incisions to form a skin flap in order to perform a subtemporal decompression. Through either opening the clot could be removed. However, if the source of the hemorrhage is the superior longitudinal sinus or its tributaries, the bone-flap method would give better access to the bleeding points. Frazier has stated that the osteoplastic flap should not be used in the treatment of cranial injuries, but in my experience I have found it to be very satisfactory in many cases. In order to allow for postoperative swelling, I prefer to make a small decompression at the base of the flap.

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[12] Gray, Henry: Textbook of Anatomy. Lea and Febiger, Philadelphia.

If the operation is performed through an entirely clean wound, complete closure of the scalp could be made with interrupted silk sutures in the temporal muscle, temporal fascia, galea and skin. The insertion of a drain should be left to the judgment of the surgeon. On the other hand, if a portion of the wound has been previously contaminated as a result of the injury, a closure of interrupted silkworm sutures would be preferable. Drainage in the latter case would be advisable. The postoperative treatment should be carried out as in depressed fractures, and the length of time required for the patient to remain in the hospital would depend upon the severity of the injury and the rapidity of the convalescence.

In fractures of the base of the skull, above or below the tentorium cerebelli, with an abundance of fresh blood in the spinal fluid, as well as the drainage of blood or cerebrospinal fluid to the exterior through potentially infected areas, the value of early surgery is rather questionable. Severe hemorrhage in the posterior cranial fossa will probably have produced death by pressure upon the vital centers within a relatively short time after the injury, and too soon for an operation to be considered. Moreover, slight bleeding in the same area is quite frequently taken care of, if the patient overcomes the immediate reaction, or will respond to spinal drainage. If the hemorrhage is in the anterior or middle fossae, with drainage to the exterior, it would also be advisable to omit early surgery. It is more important to protect the drainage points against further contamination or extension of infection, in which case nasal douches and syringing of the ear are to be avoided, and the patient should be cautioned against sneezing and blowing the nose. In one case which I observed, a fatal attack of meningitis resulted from forcefully blowing the nose two weeks after the injury occurred. Spinal drainage through the posterior cistern or by lumbar puncture is contraindicated in these cases. Limitation of fluids and dehydration are advisable. Rest and quiet are very essential and should be brought about, if necessary, by the use of codeine in heavy doses, although morphine should not be used on account of its depressing effect on the respiratory center. Elevation of the head of the bed is also recommended until after all drainage from the head cavities has ceased. If recovery occurs and the patient is permitted to go home, the usual restrictions as regards personal activity should be stressed.

COMPLICATIONS

Among the various complications incident to craniocerebral injuries are meningitis, cerebrospinal fluid fistulae, external hydrocephalus with cortical atrophy, posttraumatic headache, chronic subdural hematoma, epilepsy, neurasthenia, paralyses, blindness, deafness and so forth. Since the introduction of ventriculography and encephalography by Dandy[13] in 1919, we are able to deal with many of these complications more intelligently. The work of Penfield, Fay and others with the use of air studies in posttraumatic conditions has demonstrated the value of these methods both as diagnostic and therapeutic measures. By the use of encephalography we are able to determine the size and contour of the cerebral ventricles and subarachnoid pathways, which, together with the neurologic and other findings, indicate the proper method of treatment. In some instances all or part of the distressing symptoms have been found to disappear entirely after the air injection. Complications such as meningitis, fistulae and so forth, would not be benefitted by these methods, but would require medical and surgical management at the proper time.

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13. Dandy, W. E.: Roentgenography of the Brain after the Injection of Air into the Spinal Canal. Ann. Surg., 70:397-403, October, 1919.

COURSE OF GONORRHEA

AS RECORDED BY PHOTOMICROGRAPHS OF THE DISCHARGE*

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If we study the hypothetical gonorrhea case of John Doe from exposure till he was discharged as completely cured, it is a long and complicated story that the microscopy of this urethral discharge tells. Since he ran the gamut of all the common complications, you will know that this is not really the story of one man's infection, but is pieced together, using microscopic slides secured from many.**

After exposure, remorsefully John began looking for trouble. With much urethral squeezing he produced a small drop which under the microscope is a picture such as obtained from any clean urethra (fig. 1). There are the shedding epithelial cells, an occasional pus cell, broken down debris and the nondescript microbes that normally inhabit the fossa navicularis.

A rather belated prophylactic produced a medicinal urethritis next day (fig. 2). The slide shows more pus, some mucus, squamous cells and a few saprophytic organisms but nothing diagnostic.

On the fifth day, still clinically symptomless, the slide shows (fig. 3) some pus and gonococci on the peeling epithelium and in the serum-like discharge. The pus cells as yet have injected no organisms. The germs are free and upon the epithelial cells.

Johnnie urinated and two hours later another slide showe that the phagocytosis had begun (fig. 4), with many cells having but a few gonococci each. The center one is full.

Three hours after the first gonococcal positive slides the infected epithelial cells had degenerated and nuclei disappeared (above the center of fig. 5). The granulations are very suggestive of degenerate gonococci. Here is the first appearance of mucus. The gonococci are both extra- and intracellular.

In the center is the textbook picture. We know that phagocyte was a fighter, a glutton for food and punishment, able to do his part toward eliminating the organisms. He was still young and vigorous when placed on the slide.

The nuclear parts are still sharply outlined, retain their nuclear membranes and stain with the natural granulations distinct. The three nuclear parts are still discreet, and have not moved to join each other in hopes of mutual help in that dying gasp, as in figure 9 the central phagocyte.

The polymorphonuclear leucocyte begins its life cycle with a single round nucleus. As maturity progresses this curves to form a crescent, clubs and fragments to form the mature pus cell. Degeneration progresses reversely. The component parts of the nucleus round their edges, move towards each other, enlarge, lose their nuclear membranes, become granular and less deeply staining. The cell swells till just before disintegrating it is a large distorted thing with a granular debris taking the place of the nucleus. Notice the different sizes and shapes in these pictures. Figure 9 shows the varying degrees of leucocytic size and degeneration in all stages.

Gonococci grow wherever proper conditions as to nutrition, moisture and acidity are found suitable, coupled with the absence of inhibiting influences. They grow best on columnar epithelium, not because it is in the urethra but because all these conditions are in proper balance there. In these pictures the epithelial cells carrying gonococci have more the appearance of squamous scales (figs. 3, 5, 6 and 16 in particular).

Columnar epithelium is found in many places where gonococci rarely grow, since one of the elements, usually the inhibitory influence, is out of balance. Gonococci grow in many unusual places, when all conditions are not balanced properly, as on the cornified squamous epithelium about the vulva of the child and in the rectum of the adult.

When the body's protective mechanism is completely broken down, they grow in and upon the unbroken skin of adults to produce the condition known as blenorrhagic dermatitis. They grow best in presence of a small amount of human serum. More inhibits their growth, and more yet kills them.

Returning to our patient, he was let run till next day, reproducing the textbook fifth or sixth day slide (fig. 5). There are the well matured, healthy looking leucocytes and some epithelium. Some of the gonococci are intracellular, showing a good protective mechanism as being perfected on the part of the host.

Help by killing the surface organisms with gonococcidal injections stopped the discharge. There was no discharge next morning, so he said. By using a platinum loop smear we secured just enough for a slide (fig. 6) with no gonococci. This sparse slide, after the organisms have been killed by the infection, shows some pus cells and epithelium entangled in the mucus and no organisms. Had the so-often used cotton applicator been employed there would have been not even enough to dampen the cotton, let alone some for the slide.

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* From the Department of Urology, Harborview Hospital.

* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., August 3-5, 1931.

** Some fields show fine detail in a small area and others cover a larger field; hence the different magnification best to show the same. A photomicrograph field, being dish shaped, causes the indistinctness about the edges of some pictures. All pictures are actual photographs of the field and absolutely unretouched.

The cotton applicator is responsible for more gonococcal mistakes than we ever dream of. The gonococci may be there but not enough secretion to saturate the cotton and none for the slide. It is these cotton swab slide diagnoses that make business good for the doctor by giving false negatives.

After a few days of treatment John's discharge reappeared. Gonococci were there but too scarce to find, mixed with mucus among the few pus cells. Slides hitherto had shown but very little of this mucus. Slide 6, of the successfully treated case, would still represent what we now find, if it had a cell of gonococcus included.

For a while, then, there was no urethral discharge. Slides showed mostly squamous cells, little pus and, continuing same as the slide, figure 6 is still without germs. Local medication killed any surface gonococci that showed up before the phagocytes could inject them. The patient thought me a good

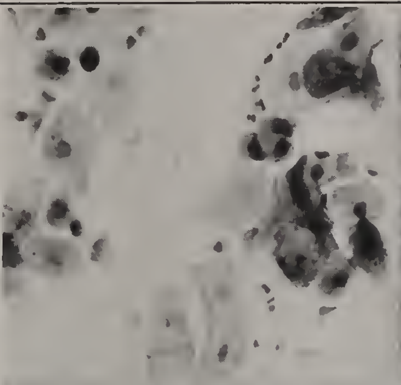
FIG. 1

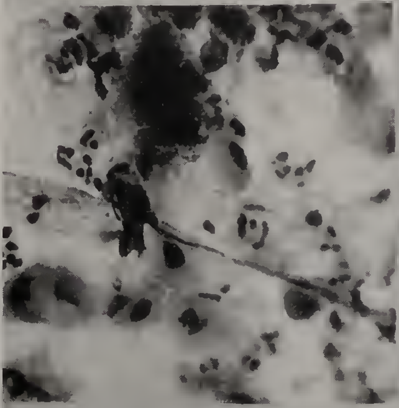
FIG. 2

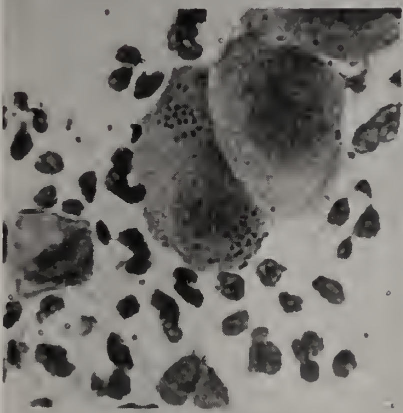
FIG. 3

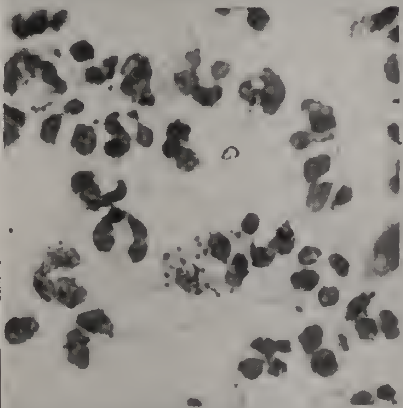
FIG. 4

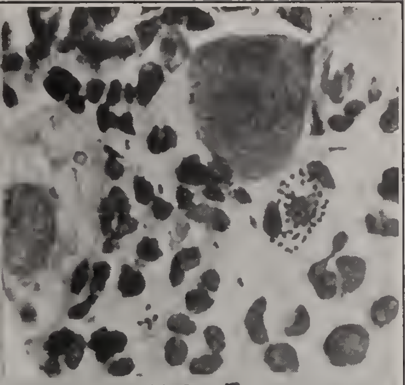
FIG. 5

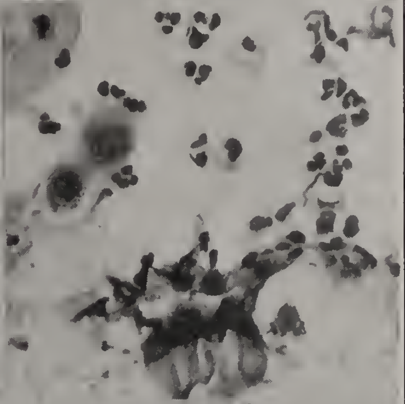
FIG. 6

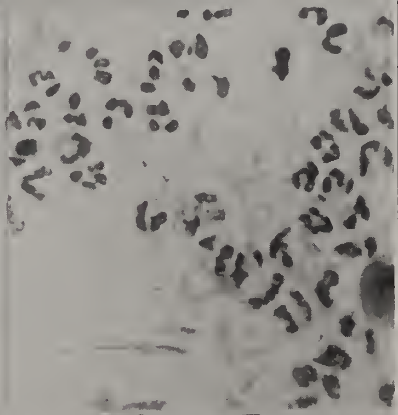
FIG. 7

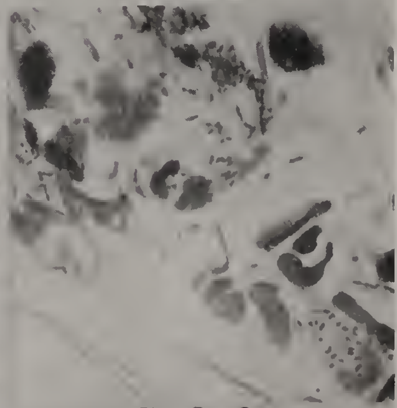
FIG. 8

Fig. 1. Discharge from an uninfected urethra, X 1000.
Fg. 2. Medicinal urethritis, X 1000.
Fig. 3. Presymptom gonococci on epithelium, X 1000.
Fig. 4. Beginning phagocytosis, X 1000.
Fig. 5. Typical early gonococci, X 1000.
Fig. 6. Successful treatment, X 1000.
Fig. 7. Urine in posterior urethritis, X 600.
Fig. 8. Mixed Infection, X 1000.

doctor at this time. He had so far suffered not a single discomfort other than mental.

On the twenty-fifth day and after seventeen days of energetic treatment the slide continued germ-free. Presto! The battle looked won, only the gonococci did not know it. Johnnie had urgency and figure 7 is his urine sediment slide. Germs still there in abundance.

It was posterior. Injections were discontinued and irrigations begun. A discharge reappeared that looked perfectly natural, full of pus and epithelium in varying degrees of disintegration and some gonococci, with addition of other organisms—bacilli (fig. 8).

On the thirtieth day after exposure John Doe thought himself "ruptured," complaining of a rather severe pain in the groin. Next day the testicle said epididymitis. The discharge disappeared as soon as the side pain came, but the causative organisms were still there with only a little pus, and gonococci entirely out of proportion to the number of pus cells.

This was the time for diathermy locally and constitutional fever treatment. John got some foreign protein. The ensuing reaction made him completely forget the epididymitis. The doctor might have been misled into thinking that the hypodermic treatment thus completely relieved the epididymitis, only the pain returned soon, as the fever and general pains from the protein shock disappeared.

The slide (fig. 9) says he was not well and tells a long story. All the gonococci are intracellular and the proportion of bacteria-containing cells is vastly increased with both pus cells and gonococci in varying degrees of degeneration. There is only a little discharge, barely enough for a spot, and one had to dig deep to get that. This specimen came from a patient who had carried a high fever for the past twenty-four hours and a temperature of 103° at the time of this slide with no noticeable discharge. And we thought fever killed gonococci!

The epididymitis lasted about a week, while the urine continued clear with no noticeable urethral discharge. As soon as the epididymitis was relieved the gonorrhea returned, and he went on injections again, using a different silver salt this time. It did not seem to do so well (fig. 10).

Notice the particles of silver about the pus cells, in the cells and everywhere. This slide was taken four hours after injection and the gonococci grew in the silver solution. The silver particles show clear, refractile in their centers and black around the edge. Notice that the mucous entanglement through the center holds gonococci and silver particles side by side.

Soon he had no microbes in the discharge again and all looked rosy. A morning urine specimen in a bottle brought to the office showed long chain bacilli (fig. 11). The freshly voided urine specimen showed only pus and no gonococci. The bacilli had grown in the bottle as contamination. What a mistake could have been made, had not a second urine freshly voided been tested.

We now irrigated and massaged the prostate with the bladder full. The why of these gonococcal returns and of the epididymitis shows the expressed prostatic and vesicular secretions. Notice the pus cells containing gonococci in the center and the spermatazoa about the mass of pus cells (fig. 12). The prostate and left vesicle carried the infection.

While Johnnie was recovering we consider a friend of his, dating his trouble from the same time as John Doe's party. The friend, being impecunious, said "let it rot," and had no treatment. Figure 13 is his slide, taken after six weeks of rotting. There is much pus but of a different character, much broken down material and various other organisms. The cells were of low vitality and stained poorly. The organisms stained much more deeply than the nuclei. Organisms are everywhere, both in the cells and out, but there is a strange lack of fresh epithelium in this smear. The epithelium had acquired a resistance and did not scale off as in our John's case. The friend, under treatment begun now, would have been well before Johnnie.

Reverting, Johnnie's dysuria became worse. A urine specimen looks staphylococcic (fig. 14). Question, which are the staphylococci and which the gonococci? When both are involute, the gram stain is not entirely reliable. The gonococci keep the stain and the staphylococci let go of it.

The methylene blue stain is about as reliable after all, when the clinician examines the slides himself. Size, shape and tendency to degeneration of organisms and their relations to each other to cells, mucus and relative quantities probably tell more to the trained eye than can be learned from a gram stained specimen.

Why has this patient taken so long to recover? The urethra, upon which gonococci grow so well, is a collapsed tube, lined with stratified columnar epithelium thrown into folds when at rest (fig. 15). The organisms grow on, in and between these epithelial cells, absorbing their nutrition from the cells themselves and the same body fluids, from which the cells get nutriment. They live like tape worms, attached to a cell and floating in a predigested nutrient fluid. With inflammation parts of this epithelium shed, leaving a denuded surface as seen in the center of this urethral photomicrograph.

Returning, from now on our man recovered steadily. The staphylococci or bacilli killed off the gonococci; possibly the treatment helped. Anyway he steadily improved. When the urine had become clear and massage specimen clean, he still had a slight discharge that neither improved or became worse, whether treating or left alone (fig. 16).

This conglomerate smear was composed of broken down material of indefinite origin, a few pus cells, an epithelial cell and various nondescript saprophytic organisms. Some looked like gonococci, but gram stain was erratic, usually positive (fig. 16). A culture showed diphtheroids, a very common inhabitant of the fossa navicularis.

When we released Johnnie as finally cured with urine clear, he continued to have that same watery discharge. The character of the urethra had changed in the course of the disease. In the beginning it was of a softer type, quite resistant to all organisms but the gonococcus.

332 Cobb Building.

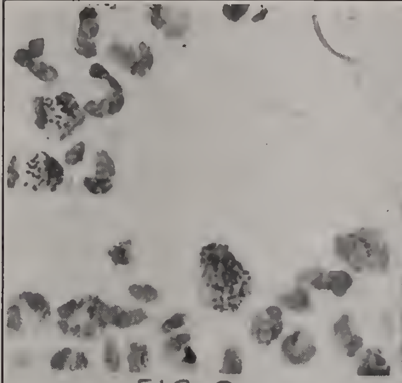
FIG. 9

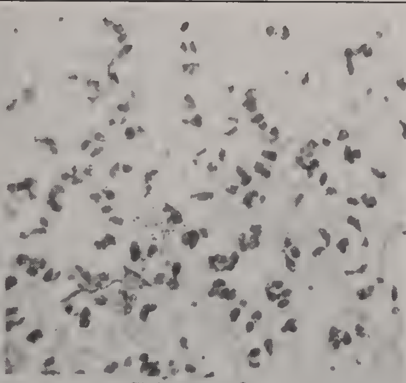
FIG. 13

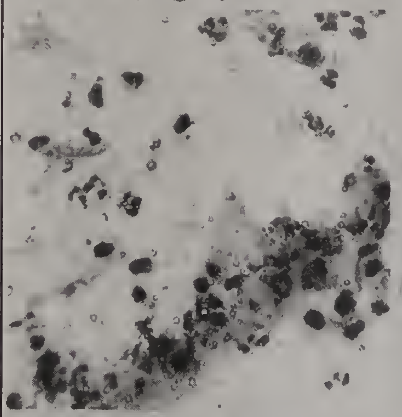
FIG. 10

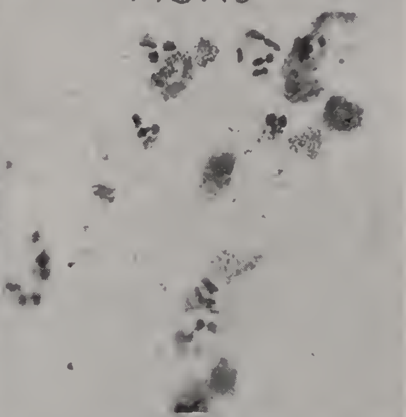
FIG. 14

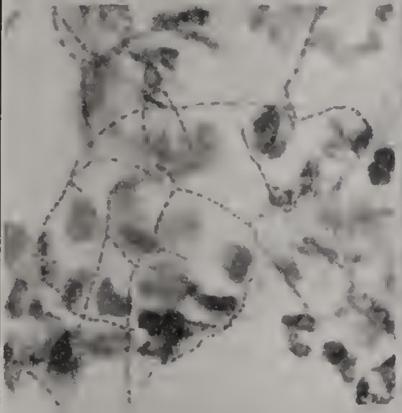
FIG. 11

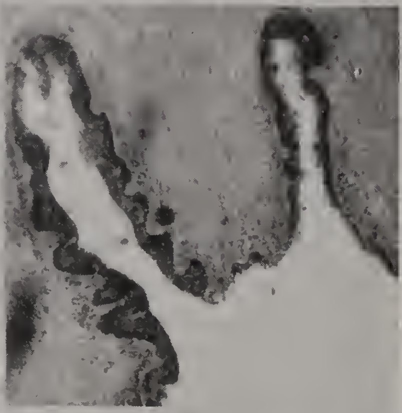
FIG. 15

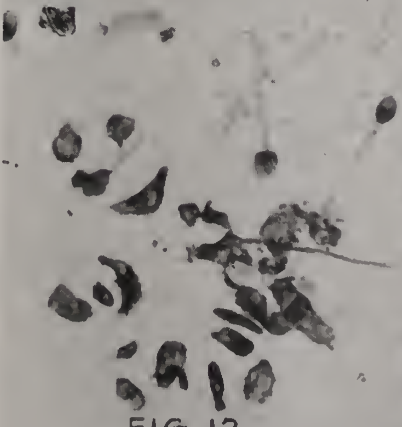
FIG. 12

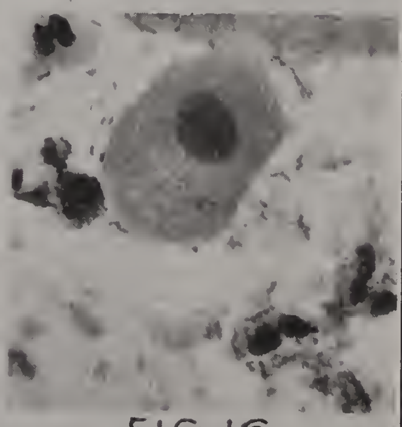
FIG. 16

Fig. 9. In fever with many gonococci, X 900.

Fig. 10. Gonococci among silver particles, X 900.

Fig. 11. Bacilli in urine, X 1000.

Fig. 12. Massage specimen showing gonococci, spermatozoa and pus, X 1000.

Fig. 13. Chronic untreated case, X 500.

Fig. 14. Staphylococci and gonococci in urine, X 600.

Fig. 15. Urethral epithelium, X 100.

Fig. 16. Gleet with no gonococci, X 1000.

BLACK TONGUE

CASE REPORTS *

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Black tongue is a descriptive term which has been used to designate a nonsurgical condition present on the dorsum of the human tongue. The name is not always significant of the affection for, although the tongue has been described as black, it may show varying intensities and color combinations of grayish white, yellow, green, brown and black. It is entirely a local disease, without striking pathology, and is devoid of alarming or systemic symptoms. It is not frequently met with and consequently not well known. Black tongue of the human must not be confused with black tongue of dogs, which is said to be the analogue of human pelagra, a systemic disease.[1]

Varied terminologies have been used with reference to this condition, some of which are descriptive, others suggesting a possible etiology. Among these are nigrities linguae, melanotrichia linguae, black-fur tongue, black-hairy and even sandy tongue. We also have keratomycosis linguae and lingual papillary keratosis.

Possibly the first reference to this condition was made in 1557 by Amatus Lusitanus, who stated that he found hairs on a man's tongue which renewed themselves, if pulled out. Since 1835 such men as Rayer, Salter (1852), Dessois (1878), Wallerand (1890) and Vollmer (1898) have studied this condition and reported cases.[2] January, 1923, Hermann Prinz read before the Philadelphia Academy of Stomatology as follows: "The disturbance, generically referred to as black tongue, has aroused my special interest because of its undetermined etiology."

ETIOLOGY

The etiology is still obscure, although the causal factor has been attributed to many and varying conditions and organisms. Some of the organisms named are saccharomyces, a yeast fungus of the genus protophyte,[3] mucorrhizopodiformis, a dark colored yeast-like mold,[4] monilia cryptococcus[5] and aspergillus niger.[6]

Black tongue may be developmental, due to some congenital defect, the filiform papillae being unusually large at birth with later hyperkeratosis of these papillae, the discoloration intensified as the result of age. A trophoneurotic disturbance, which electively predisposes the surface of the tongue to an irritation by specific substances, is of etiologic significance. Many believe the color of exogenous origin; yet there may be no sharp line of differentiation between growth and pigmentation, for the intensity of the affection, as well as the color, has been thought to be dependent upon the varying potassium sulphocyanid content of the saliva. Mercurial treatment is typical of this phase of causation. Again, the color is thought due to deposits of melanin-like pigments within the surface epithelial cells.[7]

Although there are many fungus growths normally present in the mouth, others are pathogenic, associated with destructive processes in the lungs, distinctly answerable for primary infections.[8] Catarrhal stomatitis may be a precursor of and an attending predisposing agent; therefore, neglect of oral hygiene, acid fermentation of food remnants, and improper diet not only pave the way but augment the irritation. In regard to stomatitis, we may have a sequela such as is often found in syphilitics from prolonged mercurial treatment and further inflammation of the mucous membrane by continued use of hydrogen peroxide as a mouth wash. Under this category of chemicals, strictly exogenous, may be added the cauterization of tertiary mucous patches with chromic acid and nitrate of silver, when astringent mouth washes are used at the same time. Bismuth poisoning and irritation of the oral cavity by nicotine have their adherents in this chain of causation.

PATHOLOGY AND EXPERIMENTAL STUDY

Just as the etiology has been the subject of much argument, there is no agreement to the pathology of black tongue. Some writers adopt the idea of hyperkeratosis; others combat this theory and

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* Read before a meeting of King County Medical Society, Seattle, Wash., Feb. 9, 1931.

1. Goldberger, J., Tanner, W. F. and Saye, E. B.: A Case of Black Tongue with Postmortem Findings. Pub. Health Rep., 38:2711-2715, 1923.

2. Wells, C. R. and Cooper, G. W.: Black Tongue U. S. Nav. Med. Bull., 24:12-30, Jan., 1926.

3. Christoph, Carl H.: Black Hairy Tongue (Lingua Nigra Pilosa). Ann. Otol. Rhinol. and Laryngol., 34: 949-952, Sept., 1925.

4. Gottheil, W. S.: Black Tongue: Brief Consideration of Its Etiology. Arch. Pediat., 16:255, 1899.

5. Montpellier, J. and Catanei, A.: Hairy and Sandy Tongue with Monilia. Ann. de Dermatol. et de Syphil., 7:78-87, 1926.

6. Kiefer, H. A.: A Case of Black Tongue. J. A. M. A., 47:362, Aug. 4, 1906.

7. Prinz, H.: Black Tongue. Brit. Dent. J., 46:1265-1274, Nov. 2, 1925.

8. White, A. H.: Report of a Case of Black Tongue, Due to the Growth of Mucor. Pac. Med. Jour., 59:597, 1916.

maintain with Blegvad, quoted by Knight,[9] that papillae from normal tongues are on the average just as much keratosed as those from black tongues. This is not inconsistent with his other findings, that the papillae, when colored with Van Gieson and other stains, were found to be elongated first and then chemically colored by food, wine, tobacco, iron, mercury, et cetera. Prinz shows the hypertrophied filiform papillae to be covered with mold.

Histology. Structurally the "hairs" have the outline and shape of a true hair shaft which, when examined microscopically without staining, shows different shades of yellow, green and brown on the same slide. When water is added to such a slide and examined during the process, large epithelial scales can be seen to break away from the shaft until nothing more remains but a few fibrillar processes; coccus-like bodies are present in large numbers. These are thought to be spore forms of the fungus.[10] It has been my experience, under microscopic examination, that these coccus-like bodies become less numerous or disappear entirely after these cases have been treated over a period of time.

Microscopic study of the hairs by the use of simple stains reveals no added information. Thompson and Montgomery,[11] in 1929, in the study of two cases, by the use of dextrose-agar slants, dextrose broth and nutrient broth, demonstrated an organism which they thought belonged to the genus actinomyces.

Laboratory reproduction. In an attempt to reproduce black tongue, Weidman[12] fed a culture of the thread to a monkey, which developed nodules on the axillary and facial hairs. He states: "The fact that the microorganism occurred on the tongue only under a condition of hyperkeratosis lends a certain additional weight to the circumstance; it appears that the microorganism is favored by a substrate of keratin such as occurred both in the hair of the monkey and on the tongue of the man."

Wells and Cooper differentiate the acquired or pseudohairy tongue from the true or fungoid type of the verrucous variety. In many instances the pseudoform has been traced to simple chemical agents, such as chromic acid, silver nitrate and other active astringents. Christoph mentions Oppenheim's experiment, artificial production of black tongue for fourteen days with tincture of retanhia et galla. According to Oppenheim, the permanency of the stain in the acquired hairy tongue depends on the fact that only those discolorations of the skin or mucosa are lasting where the coloring matter is in the connective tissue, or in which the proliferating horny substance has been absorbed. Beside nut galls, he demonstrated hydrogen peroxide as an agent in the production of pseudoblack tongue.

SYMPTOMATOLOGY

Most of the subjective symptoms are negligible, and the condition is usually accidentally discovered. Two of ~~my~~ patients complained of a very bitter taste, this persisting to such a degree in one case that the ability to distinguish food flavor was entirely lost. It may be annoying with salivation and slightly painful deglutition, and there may be a dry sensation in spite of unusual salivary activity. Other symptoms reported are fetor of the breath, tickling of the soft palate and crowded mouth or swollen tongue sensation.

TREATMENT

In all conditions where the etiology is unknown the treatment must necessarily be empirical. There is much difference of opinion in the quantity of the drug used, both 1 per cent and 10 per cent solution of salicylic acid having been advised. Many suggestions have been offered, including astringent mouth washes, 5 per cent chromic acid, 10 per cent bichloride of mercury, 15 per cent fibrolysin in a warm aqueous solution and 10 per cent solution of copper sulphate in distilled water. Alkaline mouth washes containing borax or potassium chloride have also been suggested. Painting with 2 per cent resorcin or swabbing with 3 per cent hydrogen peroxide is recommended, while others regard the latter as a causal factor in producing the affection.

Very few permanent cures are recorded, since relapses frequently occur. Templeton[13] reports a cure in about three weeks by the use of 1 per cent solution of mercurochrome, applied four or five times daily. The United States Naval Medical Bulletin reports two cures, and these effected in the short space of ten days.

The technic for one of these cases is as follows: Prior to treatment the mouth is sprayed with normal saline solution, the tongue wiped dry with sterile gauze, and then painted with cotton applicator saturated in a 10 per cent solution of salicylic acid in equal parts of alcohol and glycerine. This is followed in a few seconds with a 3 per cent solution of hydrogen peroxide and then by a normal saline solution. The treatment was repeated daily for nine days, but the "growth," which resembled dead wood in appearance, was removed after the third day by the mere wiping of the tongue with gauze. It completely disappeared by the end of the tenth day and did not return. No time duration of the cure is given.

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[9] Knight, C. H.: Black Tongue: Lingua Nigra Villosa with Report of a Case. Ann. Otol. Rhinol. and Laryngol., 19:631-639, Sept., 1910.

[10] Spray, R. S.: Lingua Nigra: A Case Report with Cultural Studies. So. Med. Jour., 23:844-849, Sept., 1930.

[11] Thompson, Luther and Montgomery, H.: Organism Isolated from Two Cases of "Hairy Tongue." J. A. M. A., 93:114-115, July 13, 1929.

[12] Weidman, Fred D.: The Affinities between Black Tongue and Trichomycosis. Arch. Derm. Syphil., 18: 647-665, Nov., 1928.

[13] Templeton, H. J.: Black Tongue (Lingua Nigra). Urol. and Cutan. Rev., 32:75-76, Feb., 1928.

After having tried cauterization with silver nitrate in varying strengths from 10 to 50 per cent and later curettement on a case, it was with pleasure that I tried this new mode of treatment. After following it carefully as described, in two weeks the tongue was almost entirely clear. Although I followed the same course of treatment, it was my sad experience to see the tongue resume its former condition. Continued treatment for the past eight months has thus far been without success with reference to appearance, but the ability to taste has improved and the bitter sensation has disappeared.

CASE REPORTS

Case 1. Mr. D. H. E., a lawyer, married, aged thirty-one, was first seen May 21, 1930. He stated that he had something adhering to his tongue that could not be removed by swallowing. This sensation had been present a month. He complained of a bitter taste, which the use of mouth washes and general oral hygiene did not remove.

As a child he had measles and whooping cough; at twenty-one, pneumonia. Otherwise he had enjoyed good health.

Examination of the tongue showed a small dark area on the dorsum near the base that appeared like a patch of black hairs. Teeth were in excellent condition; no history of treatment of syphilis. Smoked one package of cigarettes per day.

Condition first treated by painting the involved area with nitrate of silver in varying strengths of from 10 to 50 per cent, also curetting the growth at intervals of three to five days. The growth was very easily removed in this manner. However, it soon returned to involve even greater areas. After two months of this type of treatment, practically the entire tongue was covered, except a very small border near the tip, where the growth extended out in triangular form, and which was never involved.

It was then I commenced the treatment suggested by the United States Naval Medical Bulletin, as outlined in a preceding paragraph, salicylic acid and hydrogen peroxide. The growth disappeared entirely after two months' treatment but, contrary to their results which are reported as permanent, it again returned in a few days with the same intensity as before.

Since it had been suggested that cigarette smoking in any large amount might cause or aggravate the condition, he stopped smoking at my request but had no beneficial results thereby. The only improvement is that the patient no longer complains of the bitter taste.

Case 2. Mrs. R. Y., housewife, aged seventy, was first seen December 18, 1930. She complained of a brown coating on her tongue, also of a very bitter taste. Stated that she could not taste her food, which seemed utterly without flavor.

Microscopic examination revealed this to be a typical case of hairy tongue. There was no history of syphilis; she had no gastrointestinal disturbance or other gastric complaints. She enjoyed good health, but her teeth had all been removed and she wore a full set of dentures.

After two weeks of the 10 per cent salicylic and hydrogen peroxide treatment, the growth disappeared, also the bitter taste, and food began to have a more natural flavor. The growth has since returned.

Case 3. Mr. L. W. B., a salesman, married, aged forty-one, first seen February 2, 1931, complaining of black tongue, also of a dry throat.

Stated that last August he first became conscious of this dryness in his throat. Not until October 1, 1930, did the tongue become furry and black in appearance, involving about three-fourths of the area. Physicians in Oakland, California, diagnosed the case as black tongue. It was painted with 2 per cent mercurochrome. The growth disappeared, only to reappear again.

Diagnosis showed an extensive light yellow hairy growth, involving all except the tip of the tongue. Microscopic examination revealed this to be a typical case of hairy tongue. Patient had a marked inflammation around the tonsillar pillars, this caused by the rough growth on the tongue rubbing against them.

Treatment, same as above cases, salicylic acid and hydrogen peroxide. Recurrent attacks; when growth reappears it is very light yellow, then passes through the various shades of brown to black.

SUMMARY

That this disease is not often met with has caused a wide range of opinion as to etiology and treatment.

Black tongue may be congenital or acquired. In the former case the individual's susceptibility acts as a predisposing agent.

It seems necessary to prepare the soil by birth, incorrect diet or other irritants.

Very few permanent cures are recorded; relapses are of frequent occurrence. No two cures are reported as the result of any one mode of treatment.

CONCLUSIONS

This condition is no respecter of society, occurring in one class as frequently as another. It usually affects those in the middle and later stages of life.

It is neither contagious nor hereditary, no cases having been reported where other members of the same family have been affected.

It is my belief that mercury, bismuth, coal tar derivatives, poor oral hygiene, dyspepsia and allied conditions produce the pseudohairy tongue but play no part in the production of the true hairy tongue.

FREE CHOICE OF PHYSICIANS*

ALEXANDER H. PEACOCK, M.D.
SEATTLE, WASH.

At the last session of the House of Delegates of Washington State Medical Association an Economic Study Committee of seven was elected to study conditions of medical practice in this state. One of the fundamental principles of the past has been the right of individuals to choose their own doctors. As an outline to such study the following paper is given to you for study and consideration.

While the principle of free choice of physicians by the individual sick or wounded person is politically correct, this principle is interfered with by several economic factors.

1. The type of community has considerable influence on the practice of medicine.

a. Rural communities are mostly individualistic in character, containing farms, small shops and stores. People are widely scattered over a large area and grouping is out of the question.

b. Urban communities are essentially industrial, or trading centers, as sea ports, factories, assembly companies which supply men in organized units. Add to this organized craftsmen, builders, painters, bakers, plumbers, postal employees, firemen, policemen, department stores and hotels. These organizations purchase their supplies and service in bulk, usually annually and mostly through bids. Medical service is one item of their cost of production. They apply here their usual business methods. So far it is entirely legal to obtain medical service in this manner, by barter and contract. Adjacent to all cities are the residential and suburban populations with homes, apartments and smaller stores. These citizens as a community are mostly individualistic and medical practice among them is open.

c. Small industrial communities dependent entirely upon a mine, mill, timber cutting or special construction work, as a dam or power site, form another study. Usually isolated and distant to a large population, everything must be imported to the field of work, including medical service. The choice of physician in such a community is out of the question. A doctor coming to such a location must be assured of a sufficient income or unopposed practice; this can only be done through special privilege.

2. Next question is, who bears the cost of illness? This is always important, for the party settling the account usually dictates some of the terms. The employee pays a portion of the cost through deductions from his wages. Theoretically, employees engage their own doctors but the choice is usually determined by the employer.

The employee's role in the costs is an important one. The longer an employee is away from his job, the more it is costing the sick fund. Experience has shown him that all doctors are not equal in ability. Industrial surgery has approached the dignity of a specialty.

The individual who is not covered by insurance or sick benefits must pay his own bills for illness or accident. This group is a large one. He may call, however, any physician he chooses and as many as he chooses, provided he can afford it. This has been the custom for ages.

Comunity taxpayers. All civilized communities attempt to succor their citizens who have fallen ill and become helpless through sickness and lack of funds. This group is steadily on the increase in all Christian countries, England, Germany, France, Italy and the United States, with the dole, panel system, government sickness insurance, veterans' administration of loans, hospitalization and pensions, city clinics of all types, charity hospitals, sanitariums, hospitals for the mentally incompetent and insane, children's hospitals, tuberculosis sanitariums, isolation hospitals for contagious and venereal diseases and research clinics; the list seems endless. All these are supported by taxation or gifts of sympathetic citizens. More and more the care of the sick is assuming in character a function of federal, state and local government. Not only are these taxes increasing rapidly, but these institutions are largely attended, conducted and serviced by doctors who are giving their time and strength, free of charge, besides paying their own quota of the local taxes.

Will we continue to practice medicine according to our traditions as a semiphilanthropic service, chiefly humanitarian, and secondarily as a livelihood; or shall we discard our charity, and put the practice of medicine on a strictly business basis, even if it should mean state operation of all medical service.

3. Basis of present complaints.

a. Medical service competition is keen, for a number of individual doctors and groups are soliciting contracts. It is the law of supply and demand at work, which cannot be stopped but might be regulated. Just how are these contracts obtained?

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* Read before a meeting of Whatcom County Medical Society, Bellingham, Wash., Sept. 8, 1931.

First through friendships and social contacts. This is a custom as old as the human race. Everything being equal and sometimes unequal, people favor their friends or those whom they know rather than deal with strangers. This phase of obtaining contracts will always hold good, favoring friends.

The second method of obtaining contracts is the use of business managers, sometimes called solicitors. Frankly, it is most difficut for the average doctor to obtain contracts, satisfy workmen and make adjustments. His special phase is service; he is engrossed with the practice of medicine. In groups of doctors and clinics with a large contract clientele it is even more difficult to operate without a manager. Yet lay solicitors are expressly forbidden by the code of ethics of the American Medical Association. Business managers have been and are now employed by certain county medical societies to obtain contracts and hold their business for them. When is it right for a clinic, group or individual to employ a manager?

The third method of obtaining contracts is through bidding for patients. This is perhaps the most vicious phase of contract practice. It leads to price cutting and reduction in quality of the service rendered. It engenders bitterness and foments discord among a class of men and women who are considered above the average in intellect and education. If bidding was limited to the quality of service, no harm would be done.

The fourth method of obtaining contracts is a selection on the part of the workman or employer of the best medical service obtainable in his community. This selection is based on quality only, and is arrived at by the results obtained, good functional recovery and minimum time loss. It is based on honest competition. The clinic offering the best service at the same cost should obtain the contract. It has been repeatedly proven by figures that all surgeons are not of equal ability and certain ones obtain far better functional results than others.

4. Hospital associations are usually organized and operated by laymen. A number of contracts are secured, and doctors are employed on a salary to look after the medical and surgical services. They usually have their headquarters in one city and from that center operate a number of branch clinics or offices in other towns, camps and cities. Frequently they write a medical policy as a side line to the industrial policy.

5. Clinics are defined as groups of doctors with a minimum of three on the staff. They should cover all phases of diagnosis and treatment, either in general medicine or a specialty. When well organized, they are in a most advantageous position to bid for and take care of contracts with every department of medicine under one roof. The individual doctor finds himself much handicapped when competing with these groups. Beside writing industrial contracts many of them take limited medical contracts for the workman and his family as doctors' services, medicines, nursing and hospitalization included.

6. Benefit orders are largely built up on the services of the lodge doctor who is employed on a salary. The compensation is small, but the fees collected for services not covered by the lodge benefits is often considerable, and such connection with a benefit order often is a stepping stone to a lucrative private practice. Wherever these lodges have a large membership, it brings about lively competition with doctors in private practice.

Now we can return to our original theme, free choice of physician. Is it always feasible or possible? As a principle it is certainly correct that the patient paying his own bill has the right to call the doctor of his choice. Many other factors, however, must be considered, as isolated camps, construction sites, rural communities, lower cost of medical service by clinics over the cost of individual doctors, the superiority of professional skill of one doctor over another, the influence of industrial managers over their workmen, and the competition of lodges, clinics and hospital associations.

In the state of Ohio the industrial act specifically forbids contracts. All industrial cases are handled directly by the state which in turn pays all bills for sickness. Perhaps such a change could be made in the Industrial Act of the state of Washington. Under our present law, free choice of physician by the patient is not possible.

This question of free choice of physician involves many problems. In order to arrive at some definite conclusions, a questionnaire has been sent to every doctor registered in the state of Washington. In the near future the results of this questionnaire will be published. It is needless to state that these questions will touch every doctor in the state directly or indirectly, and should be answered, that the truth of the condition of medical practice may be known to us all. Cooperation and settling these problems among ourselves is the better solution. All doctors should be intelligent enough and fair enough to abide by the golden rule, do unto others as you would have them do unto you.

THE CITY OF EUGENE

Eugene, the county seat of Lane county, is by nature and man's works the center of one of the most productive and scenically beautiful regions in the whole of Oregon. The junction point of four rivers was chosen by early settlers as a site for this community and man has added transportation facilities, until now Eugene is an important railway division point and the center of an extensive highway system. With such natural and man-made advantages as are offered the resident of this city, it is no wonder that rapid strides have been made in the many industries and pursuits carried on within the region that has the city as its center.

According to government statistics, no other city in the United States is situated in a region as densely forested. With this fact established it is easy to understand why the major industrial activity is lumbering and its allied industries, such as planing mills and sash and door factories. Of but slightly secondary importance in this fertile region are the agricultural activities, embracing a number of crops, ranging from the staple grains and fruit crops to the hops and vegetables which form no small portion of the commodities annually shipped from Eugene. Poultry raising is another industry which has been found adaptable to this region and financially beneficial. Livestock raising, often found where logging has been carried on, due to the value of logged-off land as a grazing possibility, is also found here. This industry includes the raising of cattle for beef and hides and the raising of sheep for the market and their wool.

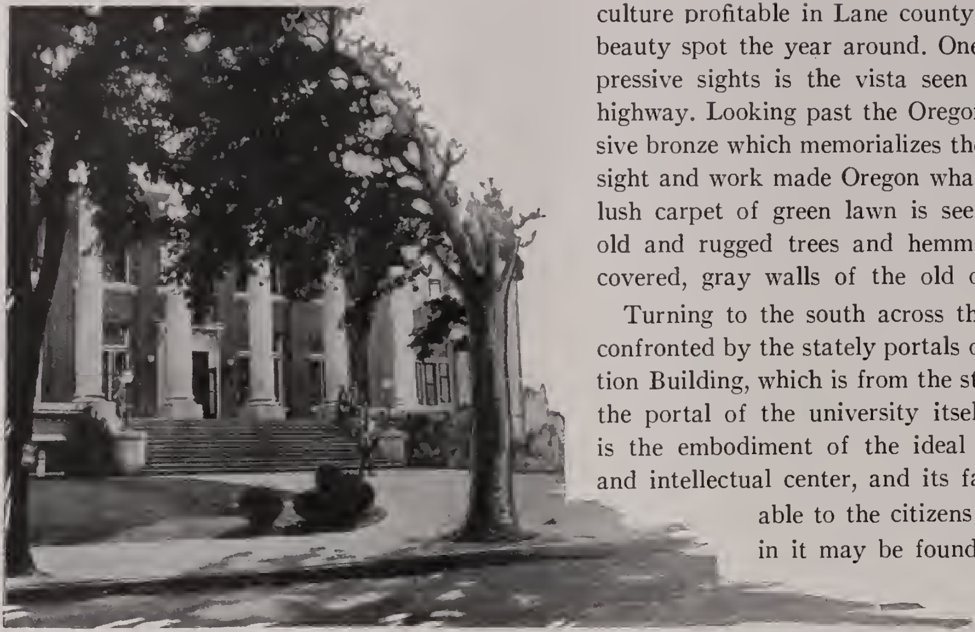
No small part of the success of the agriculturist in Lane county is due to the natural fertility of the soil, the abundant water supply and the even temperature which according to statistics covering a thirty-one year period, ranges between a maximum of eighty-one degrees in the summer months of July and August and a minimum of thirty-seven and a half degrees in the winter months of January and February. As well as making agriculture pay, this mild and constant range of temperature makes this region one in which the sportsman, of casual or habitual nature, may enjoy his pursuits to the utmost.

Eugene is sufficiently close to the so-called "wilderness" sections, where the larger game such as deer abounds, and for the fisherman no better streams could be found than the four rivers which have their junction close to the city. That this region is an accepted "sportsman's paradise" is evidenced in the fact that the state china pheasant farm is situated but four miles northeast of Eugene on the McKenzie river. From this farm there are released annually thousands of these beautiful birds. This is one of the most notable of the game conservation programs undertaken by the State of Oregon. Fish conservation is also taken care of in the Eugene district, there being state hatcheries and fish racks on both the McKenzie and Willamette rivers.

For the golfer there are two courses available and two under construction. One, the beautiful eighteen-hole course of the Eugene Country Club, is recognized as one of the most beautiful in the West, where there are many noted courses. It is on this course that the Oregon open championship tournament will be held this summer. There is also a municipal course available. A new nine-hole course is under construction not far from the southeast boundary of the city, and another near the Fairmount district may be ready for play this year.

Within the city limits of Eugene is the University of Oregon, recognized as the leading institute of

Villard Hall, second oldest building on campus. Was used as main administration building for many years on old campus.



Administration building, Johnson Hall, named from the first president of the university.

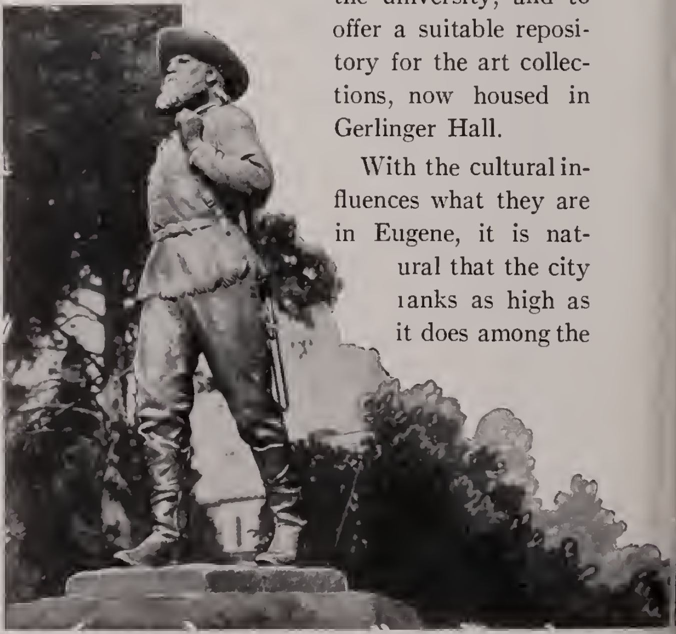
higher education in the state. This university was established in 1872 by an act of the Oregon legislature, and the first building, Deady Hall, was presented to the regents by the citizens of Lane county in 1876, making it possible for the university to start its work that year. Thus it is that the traditions of the university are closely allied with those of the city of Eugene and the city can claim a large part of the credit for the early success of the project.

Advancement along cultural lines has been almost phenomenally rapid since the founding of the University of Oregon, and it has been found almost impossible to keep up with the demands for new fields of educational activity. The curriculum now embraces the College of Literature, Science and the Arts; the Schools of Architecture and the Allied Arts, Business Administration, Education, Journalism, Law, Medicine, Music, Physical Education and Sociology; the Extension Division and the Graduate School.

The campus, portraying as it does the stages of the advance of the university in its beautiful old buildings and the large and time-worn trees, in contrast to the building activities now going on, offers a beautiful picture. The campus is divided by the Pacific highway, a separation which has isolated the older buildings, Deady and Villard Halls, from the newer and larger edifices, the Administration Building and Gerlinger Hall. Due to the same geographical and climatic values which make agriculture profitable in Lane county, the campus is a beauty spot the year around. One of the most impressive sights is the vista seen from the Pacific highway. Looking past the Oregon Pioneer, a massive bronze which memorializes the men whose foresight and work made Oregon what it has become, a lush carpet of green lawn is seen, shaded by the old and rugged trees and hemmed in by the ivy covered, gray walls of the old original buildings.

Turning to the south across the highway one is confronted by the stately portals of the Administration Building, which is from the student's viewpoint the portal of the university itself. Gerlinger Hall is the embodiment of the ideal of a recreational and intellectual center, and its facilities are available to the citizens of Eugene. Within it may be found the Oregon Museum of Fine Arts, of which Mrs. Bass Warner, donator of the Murray-Warner Collection of Oriental Art, is the director. In this collection are to be found some of the finest and rarest examples of oriental art available in the United States. A library is maintained in connection with the collection which supplements and makes possible the fullest appreciation of the treasures. A new building is under construction at the present time, the ultimate purpose of which is the providing of a memorial to Prince L. Campbell, late president of the university, and to offer a suitable repository for the art collections, now housed in Gerlinger Hall.

With the cultural influences what they are in Eugene, it is natural that the city ranks as high as it does among the



Pioneer, on old campus. The work of famous sculptor, Phemister Proctor.

intellectual centers of the country. The features of the life of the city foster the more peaceful and less strenuous pursuits, and the city is, therefore, one characterized as a good residential community. From the brief picture drawn of the assets and advantages of the district it may be seen there is here a city with many attractive features. Outside of working hours one may enjoy his leisure in pursuits as varied as his tastes may dictate. Eugene is truly a favored city, beautiful in itself and its setting and rich in its numerous traditions.

The mill race close to campus. Scene of annual canoe fete.

SLIPPING RIBS

REPORT OF A CASE

J. A. Darby, M.D.
VANCOUVER, WASH.

Bisgard[1] in the *Journal A. M. A.* recently cited ten cases of slipping ribs. The present case corresponds closely to the description given.

Male 27. Experienced pain at lower left costal region, duration about three weeks, gradually becoming worse. Pain on deep breathing, stooping, twisting, raising arms or rising from prone position, with a sense of "something breaking loose."

Pressure over the cartilage or hooking the finger under margin caused pain; sense of a grinding slip. Relief in upright or prone position. Physical examination was otherwise negative.

Under ether a curved incision was made, exposing the cartilage. The inner loose end was raised, two and one-half inches removed, and tissues closely sutured. Six weeks later there has been no return of pain.

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[1] Bisgard, J. D.: Slipping Ribs. Report of Cases, J. A. M. A. 97:23. July 4, 1931.

Epithelioma of Face. Gordon B. New and Fred Z. Havens, Rochester, Minn. (*Journal A. M. A.*, Sept. 5, 1931), believe that primary complete removal of epitheliomas of the face by surgical measures, including surgical diathermy, is the treatment of choice. For the treatment of inactive lesions, the growth may be excised or removed by surgical diathermy; the tissue removed may be replaced by a full-thickness skin graft or a pedicled flap, at the time of the primary operation. Active lesions, frequently recurrent lesions; and regions which have been subjected to radiation with involvement of cartilage or bone are best destroyed with surgical diathermy, the deformity being disregarded. Reconstructive surgery should be delayed for at least nine months to a year.

Treatment of Nephritic Edema by Acid. F. H. Lashmet, Ann Arbor, Mich., (*Journal A. M. A.*, Sept. 26, 1931), calls attention to the fact that it has been known for a long time that in the clinical state of edema there is an excess of water and of chlorides in the body. In the case of nephritic edema it has been assumed that the damaged kidneys were unable to excrete these substances and that this was the cause of the retention. Accordingly, it has been customary to restrict sharply the water and sodium chloride intake in the treatment of this type of edema. But, *a priori*, the retention of body water and chlorides may be as easily explained by assuming that the body tissues hold them and that they were never presented to the kidneys for excretion. Obviously, it is important to determine which of these hypotheses is corerct, since the treatment based on them is entirely different for each. Experiments were undertaken to determine whether nephritic edema is actually influenced by (*a*) fluid intake, (*b*) chloride intake, (*c*) total ash intake or (*d*) reaction of the ash. The patients tested had chronic nephritis with edema. The degree of edema was recorded in terms of body weight. Examples of the results obtained are demonstrated by charts. On the basis of his observations the author concludes that edema is not due to the failure of the kidneys to excrete water and is independent of the fluid intake. Edema is not due to the failure of the kidneys to excrete chlorides. Chloride as sodium chloride increases edema but as hydrochloric acid or ammonium chloride decreases edema. Apparently, the reaction of the compound is more important than the chloride content as such.

Pertussis: Its Early Diagnosis and Rectal Ether Treatment. W. Ambrose McGee, Richmond, Va. (*Journal A. M. A.*, Sept. 26, 1931), considers white and differential blood counts and isolation of the Bordet-Gengou bacillus as two reliable aids in arriving at an early diagnosis of pertussis. The latter method furnishes a means of enforcing a scientific quarantine and is a means of reducing the incidence of the disease. While rectal ether is not considered a specific for pertussis and while it may add little to the armamentarium for that disease, its simplicity and its effectiveness from the standpoint of symptomatic relief justify its use until a better form of treatment is found and proved superior.

NORTHWEST MEDICINE
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EDITORIAL

SUPREME COURT'S OPINION ON OPEN TREATMENT OF FRACTURES

The recent decision given by the Washington Supreme Court, in the case of Prather vs. Downs of Spokane, is of such vital importance to all surgeons in the treatment of fractures that it should be brought to the attention of the profession of the state. Regardless of the justice or injustice of this decision from a surgical standpoint, it remains established as the law relative to this form of practice. The court emphatically considers the use of a Lane plate as a method of last resort. Since the Supreme Court has once before given a decision that open reduction of a fracture, without first having used other methods, is prima facie evidence of malpractice, the legality of this opinion has become clearly affirmed. Following is an extract from the Supreme Court decision bearing on this point.

> "The verdict in a malpractice action should be sustained, where it appeared that an operation was performed in order to set a fractured femur without first attempting to secure a union by the use of some generally used extension process.
>
> "The evidence is ample to warrant the conclusion that the opening of the flesh, the injury thereto being wholly internal, and the insertion of a 'Lane plate' with a view of holding the ends of a broken bone in apposition and alignment, is a method of last resort, so recognized by the profession generally, because of the great danger of infection following such method of treatment.
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> "In the present case there is ample evidence to warrant the jury in finding the appellant guilty of negligence in resorting to an open operation for the purpose of effecting a union of a fractured bone without first exhausting such well-known and universally proven methods as manipulation, traction and extension processes."

REDUCED MORTALITY IN YOUTH

It is well known that the widely advertised prolongation of life during the past quarter century has been explained chiefly by the reduction of mortality in childhood and youth. Frequent illustrations have been presented testifying to the accuracy of this explanation. The health authorities of Illinois refer to this period as "youth's golden age,"* claiming history gives no account of a previous period when young people enjoyed such an abundance of good health, and evidenced a mortality so low as now prevailing among the children of this country. During the last five years in that state the death rate among people less than twenty years of age has decreased 28 per cent. The rate per 1,000 dropped from 7.1 in 1925 to 5.1 in 1930. During each of these years the number of deaths was less than the year before, while at the same time the population of that group constantly increased In the group between the ages of nineteen and thirty-five, the death rate decreased about 15 per cent, being 4.4 and 3.8 per 1,000 respectively in 1925 and 1930. On the other hand, the mortality among people over thirty-five years of age has shown no improvement in Illinois since 1925. In fact, there was presented a loss of twenty per 1,000 during each year.

This striking reduction in mortality is attributed to better sanitation, nutrition and personal hygiene, less child labor, greater freedom in the open air, and benefits of labor-saving devices; also, public health work has enormously reduced the prevalence of typhoid fever, tuberculosis, diphtheria and diarrhea, diseases which formerly prevailed most extensively during the first two decades of life. This record is not unique in the state of Illinois, but can be duplicated in all sections of the United States. It behooves the citizens of every state to maintain the existing institutions of public health and child welfare work in order that these conditions may become permanently established.

SOCIAL HYGIENE

Oregon has a Social Hygiene Society, while Washington State Medical Association and Washington Parent-Teachers Association each has a Social Hygiene Committee. All are rather active, yet there remains considerable lack of information, even among the medical profession, as to just what is the aim of this form of activity. There is a prevalent mistaken idea that social hygiene has to do only with sexology. Such is not the case. It has to do with everything making for preservation of the home. Since the family unit is founded upon sex, necessarily considerable attention must be given to correcting sexual upsets, but this is just one of its many functions.

With primitive man the family was a unit within itself, domiciled in the only safe place, the home, probably located in a cave, always at war with everything else, be it other men, the animals or the elements. Home to them was the most attractive of all places. The early man contracted his disabilities in protection of the home. These were due to injuries, natural hazards of procuring food and shelter. When he became sick he stayed at home.

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* Youth's Golden Age., Ill. Health Messenger. 3:16, Aug. 15, 1931.

The modern man, too, contracts disabilities, including sexual diseases, outside. He then stays home only long enough to distract the rest of the family and goes to the hospital. In the present wild competition for home disintegration almost everything takes part—the church, theater, school, automobile, hospital. All indoor activities, as well as the great out of doors, put up counterattractions. The only modern things really making the home attractive against outside competition are the stork and radio.

Social hygiene stresses sex education as but one means toward the end of family preservation and it must be wisely used. Misconstrued it is a boomerang. Sex education has been just about a total failure as given at present. That little knowledge, tactlessly imparted, has been too often a liability, not an asset. Better means of imparting this knowledge must be devised. Sex education belongs to the doctor and parents with both of them too poorly informed. Unconsciously they associate it with that constantly changing thing, public morals, which are but those of the class ruling at any given time.

The American Social Hygiene Association has its home in New York with various suborganizations in the different states and cities. The Oregon Social Hygiene Society is the most active in the West. California is working on one. Washington formerly had one which became defunct in all its units except that in Tacoma. At present this line of endeavor is carried on principally by health departments and in a small way by various altruistic organizations. A course in social hygiene was given at Pullman last summer and now the Parent-Teachers Association is taking it up with aims along the right line, not sexology but education to prepare for family responsibilities and better home making. There now is need for centralization and correlation of the many various efforts, that social hygiene endeavors be not pornographic and confuse medicine, education and morals.

THE IDAHO MEETING AT BOISE

The opinion was unanimous that the Idaho annual meeting at Boise last month was one of the best and most largely attended for many years. A registration of nearly one hundred is noteworthy for an organization of its size. Since the two sections of Idaho are so widely distant, the attendance on this occasion was primarily from the southern part of the state. There was a notable expression of friendliness among all present and liberal hospitality on the part of the Boise profession. A few representatives from Oregon and Washington received a warm welcome. There was a delightful afternoon tea for the ladies at the home of Mrs. Pittinger, while the golf devotees were proving their proficiency at the Country Club after the first morning session.

An unusual feature of the program was the total absence of papers from members of the state association. The quality, however, and interest in the presentations from the visitors resulted in a large attendance at the two morning sessions, which staged the program. Drs. H. C. Naffziger of San Francisco and C. L. Lowman of Los Angeles are well known in our Northwestern states. The detailed description of successful operation for relieving a case of postoperative exophthalmus by Dr. Naffziger was a fascinating recital. It was suggestive of future possibilties. Dr. Lowman's comments on anterior poliomyelitis reflected the results of a wide experience and were listened to with great interest. Besides presenting a most interesting recital of successful treatment of sterility, Dr. F. M. Loomis of Oakland also functioned as the leading attraction at the Country Club dinner. Having recently returned from a visit to Russia, where he was in intimate contact with all classes of people, his fascinating description of experiences was supplemented by a wealth of moving pictures. One could not but wonder how some of these escaped the vigilance of the censors. His descriptions furnished a living picture of the revolutionary communistic government which is producing such a mighty influence upon the world. Drs. N. Wylie Jones and Ralph Matson of Portland presented messages in their papers which held the attention of their listeners, with vital information on subjects to which they have devoted a great deal of time and experience. Those privileged to attend this meeting will retain many happy recollections both of professional and social contacts which made this a profitable and notable occasion.

THE ANNUAL MEETING AT EUGENE

Preparations are being made that will insure a successful and attractive gathering for Oregon State Medical Society at Eugene this month. The local profession is providing for social entertainment that will be particularly attractive to the visiting members and wives. The program which appears below speaks for itself. Papers presented by members of the society as well as those prepared by visitors are of a high order. It will repay all to attend this meeting who can make the necessary arrangements. Several matters vital to the future activities of the state society will be considered at this time. A plan has been completed by the Council for group liability insurance covering defense and indemnity for the members of the society. The Welfare Committee is also considering a plan for an annuity insurance. A study has been in progress on the problem of state medicine which is receiving so much attention at the present time. Data have been collected from various sources bearing on this question which will be presented at this time. Other problems also will be considered which have been the subject of special study. Thus one notes that, besides the consideration of various phases of scientific medicine, matters relative to the financial and professional welfare of the members will be under consideration.

PROGRAM

Thursday, October 22

7 a.m. Breakfast Meeting House of Delegates, Eugene Hotel.

9 a.m. Registration of Members and Delegates, Auditorium, Chamber of Commerce.

9:30 a.m. Scientific Section Meetings, Chamber of Commerce.

Medical Section

1. Reticulocytes. Edwin E. Osgood and Mable M. Wilham, Portland.
2. Types of Epilepsy. Merl Margason, Portland.

Surgical Section

1. The Prevention of Cancer. J. Earl Else, Portland.
2. The Importance of Inflammation of the Uveal Tract. Frederick A. Kiehle, Portland.

11 a.m. General Session. Auditorium, Chamber of Commerce.
President's Address. Thomas A. Griffith, The Dalles.
Clinical Amebiasis and Newer Methods of Treatment. Alfred C. Reed, University of California Medical School, San Francisco.

2 p.m. Fourth Annual Golf Tournament, Eugene Country Club.

2 p.m. Scientific Section Meetings.

Medical Section

1. The Use of Subcutaneous Injections of Oil in Infant Nutrition. R. G. Hall, Portland.
2. The Vitamin B Complex. Its Role in Infant Feeding in the Light of Our Present Knowledge. Samuel G. Henricke, Portland.
3. Blood Transfusion in Infancy. Herbert E. Goldsmith, Portland.

Surgical Section

1. Treatment of Inflammatory Conditions in the Female Pelvis. F. Bertram Zener, Portland.
2. Preventive Treatment of Vesical Diverticula. H. Welland Howard, Portland.
3. The Prevention of Postoperative Peptic Ulcer. W. E. Steinberg, Portland.

4 p.m. General Scientific Session, Auditorium, Chamber of Commerce.
Preventive Psychiatry. Henry H. Dixon, Colorado Psychopathic Hospital, Denver.

8 p.m. Public Health Educational Meeting. Rex Theatre.
Address. Health Lessons from the Orient. Alfred C. Reed, San Francisco.
Motion Pictures, "Many Happy Returns of the Day."
Program of Members' Motion Pictures, Auditorium, Chamber of Commerce.

Friday, October 23

7 a.m. Breakfast Meeting of House of Delegates, Eugene Hotel.

9 a.m. Scientific Section Meetings, Chamber of Commerce.

Medical Section

1. Acrodynia. Joseph B. Bilderback, Portland.
2. Pseudopellagra Resulting from Certain Dietary Deficiencies. Lyle B. Kingery, Portland.
3. A Hopeful View of Asthma. Robert L. Benson, Portland.
4. What the County Society Can Do for Its Members. Charles E. Hunt, Eugene.

Surgical Section

1. Radical Treatment of Carcinoma of the Bladder. R. C. Coffey, Portland.
2. End-to-end Anastomosis of the Small Bowel. George N. Pease, Portland.
3. Suppurative Pericarditis: A Surgical Consideration with Case Report. W. H. Bueermann, Portland.

11:00 a.m. General Scientific Session.
Recent Discoveries in Endocrinology. Hans Lisser, University of California Medical School, San Francisco.

12:00 m. Annual Luncheon Meeting of the Oregon Public Health League, Osborn Hotel.

2:00 p.m. Scientific Section Meetings.

Medical Section

1. Diphtheria Immunization: Comparative Value of Various Methods. C. Ulysses Moore and H. G. Dennis, Portland.
2. Treatment of Erysipelas, Diphtheria and Scarlet Fever. J. Hunter Wells, Portland.
3. The Use of Vaccine in the Treatment of Whooping Cough. Morris L. Bridgeman, Portland.
4. Report of a Case of Aleukemic Leukemia with a Mikulczs Syndrome. Irving R. Fox, Eugene.

4:00 p.m. General Scientific Session, Auditorium, Chamber of Commerce.

7:00 p.m. Annual Banquet, Eugene Hotel.
Address: Research and the State of Oregon. Arnold B. Hall, President University of Oregon.

Surgical Section

1. Syndactylizing the Fingers Preliminary to Skin Grafting. A. G. Bettman, Portland.
2. When, Where, by Whom and Why Should Fractures be Rarely Treated Openly? Andrew C. Smith, Portland.
3. Are We Up-to-date in Our Treatment of Burns? H. J. Clemments, Salem.

Saturday, October 24

7:00 a.m. Breakfast Meeting House of Delegates, Eugene Hotel.

9:00 a.m. Scientific Section Meetings, Chamber of Commerce.

Medical Section

1. A Study of 168 Deaths Attributed to Diabetes in Oregon in 1929. With Special Reference to Insulin Use. Blair Holcomb, Portland.

2. Shadow-box Colitis. Banner R. Brooks and William Dixon, Portland.
3. Undulant Fever with Report of Four Cases. G. W. Millett, Portland.

Surgical Section

1. Fractures of the Leg and, in Particular, Improvements on the Delbet Method. John H. Besson, Portland.
2. The Role of Phrenicotomy in the Treatment of Some Forms of Pulmonary Suppuration. Marr Bisaillon, Portland.
3. The Great Omentum and Omental Thrombosis. A. Holmes Johnson, Portland.

11:00 a.m. Business Meeting and Election of Officers. Auditorium, Chamber of Commerce.

2:00 p.m. General Scientific Section. Auditorium, Chamber of Commerce.
The Treatment of Varicose Veins and Varicose Ulcers. Claude F. Dixon, Mayo Clinic.

3:00 p.m. Scientific Section Meetings. Chamber of Commerce.

Medical Section

1. Syphilitic Aortitis. T. Homer Coffen, Ernest L. Boylen and Homer P. Rush, Portland.
2. Case Report Illustrating Incubation Period of Neisserian Infection. Charles D. Donahue, Eugene.
3. Chronic Coronary Disease. Leon Goldsmith, Portland.

Surgical Section

1. The Surgical Treatment of Cystocele and Prolapse of the Uterus. Raymond R. Watkins.
2. Trichomonas Vaginalis Vaginitis: Its Clinical Aspects. Martin S. Sichel, Portland.
3. Pelvic Tumors and Pregnancy. Albert Mathieu and Albert Holman, Portland.
4. Our Futile Intelligence. Goodrich C. Schauffler, Portland.

6:30 p.m. Stunt Dinner. Awarding of Golf Prizes. Osborn Hotel.

7:30 p.m. Night Football Game, Hayward Field. University of Oregon "Frosh" vs. Oregon State College "Rooks."

ERRATUM

In the paper, "Galvanic Therapy," by Dr. Clarence A. Smith, published in the September issue, it was stated that the reaction at the positive pole is alkaline and acid at the negative. This statement was published erroneously, the reverse being true. The reaction is acid at the positive pole and alkaline at the negative.

MEDICAL NOTES

American Urological Association. The Western Branch of the American Urological Association will hold its seventh annual meeting at St. Francis Hotel, San Francisco, November 6-7. There will be scientific papers presented, with wet and dry clinics. There will be an opportunity to witness the football game between the universities of Washington and California. A golf tournament is scheduled and a dinner dance at Tait's-at-the-Beach. Extensive plans have been made for the entertainment of visiting ladies and it is expected this will be the best meeting in the history of this organization.

OREGON

Roseburg Gets Soldiers' Home. Word has recently been received that Roseburg has been chosen as the site of the $2,000,000 Soldiers' Home for the Northwest. Specifications call for a hospital capable of housing 4500 disabled war veterans. The first unit, involving $1,000,000 and planned to house 1500 patients, will be built first and additions provided as needed. According to the estimates of the hospitalization board, the home will be filled capacity within three years. About 700 now in Veterans hospitals will be moved to the home on its completion. Though no definite time has been set for construction to begin, plans for the home are now ready and it is expected that, in line with unemployment relief program, preliminary work will be rushed.

New County Society Formed. Organization of the Columbia County Medical Society was effected Wednesday, September 9, at St. Helens. Dr. Edwin Ross, oldest physician in the county in point of service, was elected first president. Dr. James L. Wooden, of Clatskanie, was elected vice-president and Dr. M. A. Kenny of Rainier, secretary-treasurer. Dr. E. C. Dalton, of St. Helens was chosen delegate to the state convention. Board of Censors: Dr. R. M. Eby, Vernonia, one year; Dr. W. W. Ball, Clatskanie, two years; Dr. A. C. McCown, Scappoose, three years. Committee on public health: Dr. L. G. Ross, St. Helens; Dr. J. A. Hughes, Vernonia; Dr. E. W. Parks, St. Helens. Dr. J. H. Flynn, St. Helens, was named on the committee on scientific programs. The meeting for organization of the society was preceded by a dinner. The new society will meet once a month, the next meeting being October 14.

Improvements at Hospital. Mercy Hospital, at North Bend, has recently been improved by installation of new and modern roentgen-ray machine. Special provision for films has been made. Other improvements include building a sun porch and some other outside work.

Ground Broken for New Hospital. The new community hospital at May and Thirteenth Streets, Hood River, was started Friday, August 21, when the ceremony of breaking the ground was instituted.

Preparations for State Society Meeting. Plans for the convention of the Oregon State Medical Society, to be held in Eugene October 22-24, are going forward rapidly in the hands of a committee headed by Dr. Orville Waller. Among events of the program will be a banquet and golf tournament. A football game is also on the schedule of entertainment for the visiting doctors.

Jackson County Medical Society met at the home of Dr. C. A. Forbes, Wednesday, September 2, for the first meeting of the fall season. Dr. Charles T. Sweeney, of Medford, presided, and Dr. W. H. Heckman, of Medford, presented the paper of the evening on "Kindness."

Dr. James Sears has located in Salem to become associated with the Salem clinic as eye, ear, nose and throat specialist. He is a University of Oregon Medical School graduate and has for the past three years been practicing at Hermiston.

Postgraduate Study Ahead. Dr. F. L. Ralston, of La Grande, has recently left for Europe, where he will spend four to six months in postgraduate study in Vienna. During his absence Dr. Beattie will be in his office.

Dr. L. M. Kelley, formerly of Salt Lake City, has located in Rupert, where he will open offices in the E. E. Fisher Bldg. He will be associated with Dr. Leland B. Frazier at the Rupert General Hospital.

Union County Medical Society Organized. Physicians of La Grande and vicinity met on September 17 to organize the Union County Medical Society. Dr. W. K. Ross, La

Grande, was elected president, Dr. M. T. Phy, Hot Lake, vice-president, Lewa Wilkes, La Grande, secretary-treasurer. Dr. J. D. Haun, La Grande, was chosen delegate to the state convention.

Umatilla Medical Society Organized. Physicians of Umatilla County met at Pendleton September 17 with Dr. T. E. Griffith, president of the Oregon State Medical Society, to complete the organization of an Umatilla Medical Society. The following officers were elected: Dr. E. O. Parker, president; Dr. H. J. Kavanaugh, vice-president; Dr. G. L. McBee, secretary-treasurer, all of Pendleton. Dr. J. P. Brennan, Pendleton, was elected delegate to the Oregon State Medical Society meeting to be held October 22-24.

Dr. B. J. Ashley has opened offices in Corvallis, where he will practice and specialize in eye, ear, nose and throat conditions. He is a graduate of the University of Kansas Medical School and has taken graduate work at the University of Pennsylvania.

Dr. Harvey A. Woods has recently established offices in the Swedenburg Building at Ashland. He has recently graduated from the University of Oregon Medical School.

Dr. F. Floyd South, Portland, has returned after three months spent in postgraduate study in New York.

Dr. B. K. Zaring, formerly of Indiana, has recently located in Grace.

WASHINGTON

New Veterans' Home Opened. Formal dedication of the new Veterans' Home at Retsil was announced by the superintendent for September 16. It is the result of two years construction at an outlay of approximately $200,000. It will be equipped with 200 beds in dormitories and private rooms. The new building is of three stories, 240 feet in length, and is built of reinforced concrete and brick. It is an interesting fact that the Washington Veterans' Home ranks first of the State Soldiers Homes of the United States. The old building will be remodeled.

Hospital Reopened. The Conway hospital at Elma, closed since July, 1930, reopened on September 1. The hospital was closed in conformity with the general closing of the mills and camps in its vicinity. Dr. Conway believes that the needs of the community justify the reopening at this time.

Hospital Closed. After nineteen years of service, the Arlington General Hospital, which is privately owned by Dr. E. C. Leach, is unable to continue operation profitably. He states that it will remain closed unless sponsored by some other plan or group.

Sanatorium Superintendent Resigns. Dr. H. G. Burden, for the past two years medical superintendent at the Walla Walla Sanatorium, has severed his connection with that institution and will enter private practice in Boise.

Medical Society Files Articles. The Whatcom County Medical Society, incorporated in Bellingham, filed articles of incorporation with the state secretary at Olympia, September 15.

Receives Johns Hopkins Fellowship. Dr. Adolph Weinzirl, of Seattle, has been awarded a year's fellowship at Johns Hopkins University, Baltimore. This comes through the international health division of Rockefeller Foundation. He has been assistant health commissioner of Seattle for the past five years.

New Physician at Cashmere. Dr. L. M. Thompson, formerly of Odessa, has opened offices for the practice of medicine in the Cashmere State Bank Building. He has practiced for twelve years in Odessa.

Dr. L. W. Gregory, formerly of Marionette and Manitowoc, Wis., has recently opened an office in the Capitol Park Building, at Olympia. For the past three years he has been attending graduate schools in Philadelphia, New York and Washington, D. C. He has just returned from six months' study in London and six months in Vienna.

Klickitat-Skamania Counties Society and a number of invited guests held its first fall meeting at Stevenson, October 22. At the afternoon meeting, held at the Wigwam theatre, Dr. A. E. Stuht, who has charge of the state department of health, Seattle, and Dr. Wilson Johnston, Portland, addressed the parents and pupils on timely topics.

Whatcom County Medical Society held a banquet meeting at the Hotel Leopold, Bellingham, Tuesday evening, September 8. Dr. J. R. Whitacre, state president, was the speaker. Drs. Young and Peacock, of Seattle, were also visitors.

Public Health Service Doctor Leaves for Alaska. Dr. Frank S. Fellows will leave Seattle to assume his duties as district medical director for Alaska. He will coordinate, for the first time, the government's medical activities through the territory. His medical staff will consist of ten physicians, thirty-four nurses and six hospitals, with nearly 30,000 natives as his prospective patients.

Dr. R. E. Mosiman, of Seattle, returned last month after several months' absence in Europe. Most of the time was devoted to study in Vienna. With his family he visited cities in other continental countries.

Awards for Seattle Physicians. The Seattle Academy of Surgery has recently awarded bronze placques for outstanding work by some of its members during the past years. Dr. I. H. Moore received the award for 1928 for a paper on, "A Few Thoughts on the Colon." Dr. Ivan A. Weichbrodt, the 1929 winner, read a paper on "Longevity," while Dr. F. L. Horsfall received the 1930 prize for a paper, "Cancer of the Colon."

Dr. J. B. Stone, of Pasco, has announced the removal of his offices to Spokane, on his return from postgraduate work in Vienna.

Doctor Leaving the Northwest. Dr. F. J. Stephenson, who has resided in Everson for several years, has left for his former home in Townsend, Vt.

Dr. F. S. Palmer, of Seattle, returned last month, having spent the past four months with Mrs. Dr. Palmer in travel through the British Isles and France.

New Physician for Odessa. Dr. L. J. Bonney, recent graduate of University of Oregon Medical School, who has just completed his internship in Seattle, will take over the practice of Dr. L. M. Thompson, of Odessa, who has gone to Cashmere.

Drinker Respirators for Seattle. Some slight solace in the death of Dr. Harry C. Olmsted is to be obtained, since his passing will probably be the means of bringing a number of the Drinker respirators to Seattle. A movement is on foot to establish one of them at the Orthopedic hospital as a memorial to Dr. Olmsted.

Dr. L. R. Friend has located in Bothell, taking over the offices of the late Dr. E. E. Lytle. He was formerly associated with the Virginia Mason hospital in Seattle.

Dr. H. R. Bankerd has located at Toppenish after having practiced in Klickitat for a twenty-six year period.

OBITUARIES

Dr. Harry C. Olmsted of Seattle, Wash., died at Saint Vincent's Hospital, Portland, Ore., September 16, aged 34 years, after an illness of three days from anterior poliomyelitis, with rapidly ascending paralysis. He was taken to Portland for treatment with a Drinker respirator on account of paralysis of the respiratory muscles. Death followed from cardiac paralysis. He was born in Spokane in 1897. After studying two years at Washington State College, he entered Rush Medical College in Chicago, receiving his medical degree in 1922. He served as intern at Presbyterian and Cook County hospitals and Children's Memorial Hospital in Chicago. He located in Seattle in 1925, specializing as a pediatrician. He was one of the best known and successful specialists in this line of practice, serving on the staff of the Children's Orthopedic and other hospitals. For two years he was assistant editor of Northwest Medicine. He possessed a lovable disposition which made many friends among the medical profession and a numerous clientele of parents and children. This, accompanied with accurate knowledge and experience in his special line of practice, made him an ideal physician for practice among children. His death will be felt as a distinct loss to the people of the Northwest.

Dr. John B. Manning of Santa Barbara, Calif., died September 2, following an acute cardiac attack, aged 52 years. He was born in Boston, Mass., in 1879. He graduated from Harvard University in 1903 and from Harvard Medical School in 1906. He served as intern in Worcester City Hospital and the Children's Hospital in Boston, after which he studied abroad, making a specialty of pediatrics. He located for practice in Seattle in 1911. In 1917 he joined the Red Cross service and was located in Paris until the end of the war, attending to the needs of children in that country. In 1919 he again joined the Red Cross service and returned to Europe to establish health centers in Poland and other Baltic countries. Following this he suffered a serious breakdown in health, being confined in hospital and was out of practice for more than two years. In 1924 he located in Santa Barbara, where he practiced until his death. He was a successful pediatrician and filled many important health and civic positions in Santa Barbara. His death is lamented by a large circle of friends and patients.

Dr. John C. Dwyer, of Coeur d'Alene, Idaho, died at Deaconess hospital, Spokane, August 13, the result of an automobile accident which occurred that day, aged 59 years. He was born at Coshocton, Ohio, in 1872. He graduated from University of Illinois College of Medicine in 1901. After serving a year of internship at the Presidio hospital, San Francisco, he located at Harrison, Idaho, in 1902. He moved to Coeur d'Alene in 1904. He served during the World War, being commissioned captain. He was located at Camp Fremont, Kansas. He was mayor of Coeur d'Alene from 1922 to 1923, refusing renomination. He was surgeon of the Northern Pacific Railroad twenty-seven years. He developed a large practice and had a host of friends within and without the medical profession in the Inland Empire.

Dr. Conrad N. Suttner, of Alhambra, Calif., died at Los Angeles from pneumonia following an operation in August, aged 63 years. He graduated from the Kentucky School of Medicine in 1896. In 1900 he located for practice at Walla Walla, Wash., where he developed a good practice with a wide acquaintance. In 1916 he moved to Spokane, where he practiced until about four years ago, when he moved to Southern Californa. While in Walla Walla he served a term as president of the state medical association.

Dr. Newton Whitney Wear, of Bellingham, Wash., died at St. Joseph's hospital Tuesday, September 8, aged 52. He had recently returned from Rochester, Minn., and had been in ill health for more than a year. He came to Bellingham twenty-seven years ago from his former home in Plymouth, Ill. He was a graduate from the University of Illinois College of Medicine in 1903. At the time of his death he was serving his third term as coroner of Whatcom county.

Dr. Andrew McCracken, pioneer physician of Zillah, Wash., died of apoplexy at the family home, Saturday, Aug. 22, aged 70 years. He was born in the Province of Ontario, Canada, in 1861. He was a graduate from the Kentucky State School of Medicine, at Louisville, in 1891 and moved to the Yakima valley in 1892. In the early days he had a large and extensive practice, but of late years had not practiced his profession on account of ill health.

Dr. Alfred R. Bailey, of Seattle, Wash., died at his home Saturday, August 29, from a sudden heart attack, aged 71 years. He was born in Clarksville, Tenn., in 1860. He graduated from University of Nashville Medical School in 1888. He located in Seattle in 1890 and practiced medicine with his father-in-law, the late Dr. Yandell. Later he was in the government service in Skagit County for seventeen years and for the past four years had been connected with the health department of U. S. Immigration Station, Seattle. .

Dr. Victor V. Bacon of Spokane, Wash., died Thursday, September 17, at his home in Spokane, aged 69. He was born in 1862. He graduated from Chicago Homeopathic Medical College in 1887 and from Illinois College of Medicine in 1898. He was connected with Spokane Health Department for a period of fifteen years.

Dr. R. A. Verdier, recently of Midland, Texas, who located in Corvallis, Ore., on July 1 of this year, died in the Northwestern hospital at Eugene, August 20, following an operation for mastoid trouble. He was a graduate of the Atlanta School of Medicine in 1908.

Dr. Thomas B. Holder, of Preston, Idaho, died March 11. He obtained his medical degree at Missouri Medical College at St. Louis, in 1882. He located for practice in Preston in 1924, where he lived until his death.

REPORTS OF SOCIETY MEETINGS

IDAHO STATE MEDICAL ASSOCIATION

PROCEEDINGS OF THE THIRTY-NINTH ANNUAL MEETING OF IDAHO STATE MEDICAL ASSOCIATION, BOISE, IDA., SEPTEMBER 29-30, 1931

The thirty-ninth annual meeting of Idaho State Medical Association was held in the House of Delegates, State Capitol Building, Boise, Ida., Sept. 29-30, 1931.

House of Delegates

September 29

The following resolutions were adopted.

1. *Resolved*: That Idaho State Medical Association expresses its appreciation for the splended publicity given by the various newspapers throughout the state and especially those of Boise.

2. *Resolved*: That the Idaho State Medical Association endorses the activities of the American Medical Association in its endeavor to establish a uniform fee for the preparation of insurance papers and reports.

3. *Resolved*: That Idaho State Medical Association call to the attention of its various component societies the great value of *Hygeia* as a disseminator of safe, accurate health information.

4. *Resolved*: That Idaho State Medical Association request each component society in the manner best fitted to its locality to place *Hygeia* before the various clubs, etc., which have the interest of health as one of their functions.

5. *Resolved*: That Idaho State Medical Association place itself in such position that it shall have accurate knowledge of the various state institutions which deal with public health problems and the care of the sick, so that it may advise proper officials of these institutions in matters relative to the improvement of the care of their charges.

6. *Resolved*: That Idaho State Medical Association create a committee to make such observations and studies as outlined in the above resolution.

The following officers were elected for 1932.

Election of Officers

President-elect, E. N. Roberts, Pocatello.
Secretary-treasurer, H. W. Stone, Boise.
Councillor, West District, J. S. Stewart, Boise.
Delegate A. M. A., C. R. Scott, Twin Falls.
Alternate Delegate A. M. A., G. R. Proctor, Nampa.
Scientific Committee, A. C. Jones, Boise, W. F. Howard, Pocatello.
Public Relations and Legislation Committee, F. W. Almond, Boise, G. O. A. Kellogg, Nampa.
Number of doctors registered, 89.

OREGON

MARION-POLK-YAMHILL COUNTIES SOCIETY

Pres., R. L. Wood; Secty., W. W. Baum

The Tri-County Medical Society met at the Marion Hotel, Salem, Tuesday, September 1, for a banquet and business program meeting. A large representation of medical men from the three counties were present.

Dr. Banner R. Brook, of Portland, was the speaker of the evening on the general subject of proctology, with discussion by Dr. Burton Myers of Salem. Dr. H. J. Clements of Salem read a paper on the subject of electrocardiograph.

Delegates elected to the state medical convention to be held in Eugene were Drs. W. W. Baum and R. E. Lee Wood of Salem; alternates, Drs. Gerald Smith of Woodburn and R. E. Kleinsorge of Silverton.

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of King County Medical Society was held September 14 at the auditorium of the Medical-Dental Building, Seattle, with President R. J. McCurdy in the chair. About 170 members were present.

Mr. M. E. Morgan addressed the society in the interests of the 1931 Community Fund campaign, urging the members to help as much as possible.

A letter was read from Dr. W. H. Corson, superintendent of Harborview Hospital, asking the appointment of a committee to investigate the hospital. President McCurdy appointed Drs. A. C. Crookall and W. T. Woolley to select a committee to work with them to make the investigation.

Applications for membership were read from Drs. E. A. Nixon and Edward Le Cocq.

Dr. A. H. Peacock read a report of the Proceedings of the House of Delegates at the recent meeting of Washington State Medical Association at Aberdeen.

Two talking motion pictures were exhibited, one demonstrating "Anatomy of Female Pelvis and Perineum," the other exhibiting "Subtotal Abdominal Hysterectomy for Uterine Fibroids."

PIERCE COUNTY MEDICAL SOCIETY

Pres., R. C. Schaffer; Secty., W. B. Penney

The regular meeting of the Pierce County Medical Society was held in the auditorium of the Rhodes Medical Arts Building, Tacoma, September 8, Dr. R. C. Schaeffer, President, in the chair.

Dr. W. B. McCreery read a paper entitled, "Some Observations on Cesarean Section." He believes that too many cesarean sections are being done, and that the low subperitoneal is the operation of choice in the majority of cases. The paper was discussed by Drs. P.C. Kyle, F. S. Hermann and S. S. Jones.

Dr. Herrmann gave a case report of abdominal hydrocele with a large hernia, in which final results after operation were excellent. He also spoke of the programs which he is trying to arrange for the coming year, and asked for case reports of interesting cases to be presented.

Dr. W. B. Penney gave a short report of the meeting of the American Medical Association in Philadelphia last summer.

Col. John A. Clark and Capt. A. L. Gorby, of the Station Hospital, Fort Lewis, were accepted as associate members of the society.

The applications of Drs. C. I. Drummond, T. H. Duerfeldt and G. C. Kohl were read.

The transfer of Dr. Edwin J. Warren from King County Medical Society was accepted.

YAKIMA COUNTY MEDICAL SOCIETY

Pres., Kay England; Secty., Ralph Shirey

Yakima County Medical Society held a regular monthly meeting at Yakima, September 14.

Dr. W. Ray Jones, of Seattle, read a paper on "Gonorrhea Debunked," which excited much interest among the members present.

Dr. O. H. Cox, United States Public Health Service, read a paper on "Public Versus Private Medicine." It contained many suggestions and elicited much discussion. Routine business followed reading of the papers.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Handbook of Physiology. By W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S., Emeritus Professor of Physiology, University of London, King's College; and R. J. S. McDowall, M.B., D.Sc., F.R.C.P. (Edin.), Professor of Physiology, University of London, King's College. Nineteenth Edition. With Numerous Illustrations in the Text, many of which are Colored, and four Colored Plates. 842 pp. $4.75. P. Blakiston's Son & Co., Philadelphia, 1930.

This edition is written on a physiologic rather than an anatomic basis, former editions having been written largely on the anatomic basis. The book has been slightly reduced in size by leaving out considerable histology. It was originally called Kirke's Physiology and was based on the lectufires of Sir J. Paget. Later Professor Halliburton became associated with Kirke and finally assumed full responsibi lity of the work. It then became known as Haliburton's Hand Book of Physiology. The first edition of Kirke's Physiology appeared in 1848 and during all these years the book has been standard for medical students. The work seems well balanced. No excessive amount of space is given to any one subject. Controversial points have been avoided and in spite of its brevity the discussion is clear. Particular attention is given to the practical side. It is a good book for the medical student and also for the physician who wishes a general review of up-to-date physiology.

Griswold.

An Introduction to Gynecology. By C. Jeff Miller, M.D., Professor of Gynecology, Tulane University School of Medicine, New Orelans, etc. Illustrated. 327 pp. $5.00. The C. V. Mosby Co., St. Louis, 1931.

This work is an elaboration of the short student outline which the author published some three years ago. He limits its field to the use of beginning students and has divided it into sixteen sections which correspond to the sixteen sessions offered to the junior gynecologic student. With this in mind only the vital essentials have been included, therapy not being touched upon. Brief chapters on embryology, anatomy and physiology of the pelvic organs are given. The physiology of the menstrual cycle is entered into in great detail and Schroeder's conception of the endometrial changes is adhered to. The glands of internal secretion are next discussed, thus basing what follows upon our modern conception of endocrinology. A detailed discussion of the methods of examination and diagnosis of gynecologic patients is covered in the next chapter, including laboratory examinations. The Abherhalden test for pregnancy might well be deleted from the next edition, and space now devoted to it added to the paragraph describing the Aschheim-Zondek test for pregnancy.

An excellent description of gonorrhea is offered, excellent both because of its brevity and strikingly clear arrangement. Short descriptions of the other inflammatory lesions are included, among which are leucoplakia, although this may not be based on strictly inflammatory etiology. Chapter seven is devoted to birth injuries, in addition to which other obstetric sequelae are featured. The next section takes up malpositions of the uterus, succeeding chapters dealing with neoplasms of the genital tract. The one covering carcinoma of the cervix is very detailed. Students may possibly be confused by the introduction of several histologic classifications, including that of Schottlander as well as that of Martzloff. An entire chapter is devoted to endometriosis. Ovarian cysts are grouped according to Gardner's classification. The final three chapters cover functional disorders, among which is included, probably with justice, ectopic gestation.

The entire book is well arranged and gotten up. Students should welcome this introductory work which reduces materially the labor of entering into the new subject of gynecology. The illustrations are numerous and well chosen. They have all been obtained from diverse sources, to which due credit is given.

C. D. Shannon.

The Collected Papers of the Mayo Clinic and the Mayo Foundation for 1930. Volume XXII. Edited by Mrs. Maud H. Mellish-Wilson, Richard M. Hewitt, B. A., M. A., M. D., and Mildred A. Felker, B. S. Octavo Volume of 1125 pages, with 234 illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $13.00 net.

This collection, the twenty-second of the series, again embodies a wealth of observations and conclusions based upon abundant clinical material. The heavy artillery of massive statistics is brought to bear in almost every article. Of the 482 papers issuing from The Mayo Clinic and The Mayo Foundation, 85 are here reprinted in full, 30 are abridged, 55 are abstracted, and of 312 only the titles are listed. The reader would prefer the complete rather than the abstracted surgical article in many instances, substituting these in place of many papers on technical research problems given in their entirety.

Noteworthy in the Collection are treatises on biliary and pancreatic surgery by the Mayos and Judd, a recapitulation of the cancer-ulcer problem in gastric lesions by MacCarty, and a description of surgical procedures for the relief of duodenal and gastric ulcer with results by Balfour. A number of interesting surgical problems dealing with the sympathetic nervous system in peripheral vascular disorders, Hirschsprung's disease, and disturbed bladder function are covered in this volume.

Rankin's contribution to an improvement of the Mikulicz procedure in excision of carcinoma of the colon constitutes an important step forward in this difficult problem. The absence of articles by Plummer on the thyroid gland is to be regretted. Excellent illustrations supplement the text throughout and elucidate many descriptions. The issue continues the high traditions of its twenty-one predecessors.

Gunby.

What the Public Should Know About Childbirth. By Walker B. Gossett, M. D. 290 pp. $2.00. The Midwest Company, Minneapolis, 1931.

Since pregnancy is a physiologic condition, not only physicians but lay individuals need information as to the fundamental principles concerned, as well as facts pertaining to parturition. The book contains interesting chapters on obstetric history, also on superstitions and customs pertaining to childbirth. One notes the widest possible difference between the barbarous and civilized treatment of women during delivery. The author seems to think that twilight sleep, the employment of scopolamine and morphine, has lost most of its popularity, while nitrous oxide gas is greatly to be preferred. The opinion of numerous obstetricians favors hospital delivery, as greatly conducive to the safety of mother and child. The fact that nearly 17,000 women die in this country during childbirth, making the United States the twentieth among nations in this form of mortality, is a standing reproach to the medical profession. A chapter deals with moral problems in Catholic hospitals, presenting many quotations forbidding induction of abortion previous to fetal viability, regardless of saving maternal life. Indirect abortion is permissible, accompanying operation for cancer of the uterus, ruptured tubal pregnancy and other conditions which do not directly affect the fetus. There is no known method of knowing the sex of the unborn child. Neither can any external influence affect the sex of the infant during pregnancy. To predict whether a male or female shall be born is also beyond our ken.

THE INFANT WELFARE MOVEMENT IN THE EIGHTEENTH CENTURY. By Ernest Caulfield, M.S., M.D. With a foreword by George Frederic Still, M.A., M.D. (Cantab.), Hon. LL.D. (Edin.), F.R.C.P. (London). With eight illustrations. 203 pp. $2.00. Paul B. Hoeber, Inc., New York.

In the words of Dr. Still, "the picture the author draws of the wastage of infant life, the massacre of the innocents in England in the eighteenth century, is probably no whit overdrawn. Anyone who has studied the social conditions of that period and particularly the methods of infant management which then prevailed can hardly doubt the accuracy of figures which showed a mortality of about 75 per cent before the age of two years amongst the population in general, and the probability of an even higher mortality amongst the infants of the poor." Nevertheless, as he points out, it was a century of awakening and progress in the care of infants and of older children too. The author makes his book very interesting by giving numerous quotations from documents of the times, from personal letters and from writings of the men who were active in the cause of infant welfare in the eighteenth century. C. L. SMITH.

CLINICAL DIETETICS. A Textbook for Physicians, Students and Dietitians. By Harry Gauss, M.S., M.D., F.A.C.P. Instructor in Medicine, University of Colorado School of Medicine, Assisted by E. V. Gauss, B.A., formerly Dietitian, Presbyterian Hospital, Denver. Illustrated. 490 pp. $8.00. The C. V. Mosby Co., St. Louis, 1931.

The subject of dietetics has not received the attention at the hands of medical practitioners which it deserves. It is generally delegated to the dietitians in hospitals and to the mothers in homes. The former are well trained and generally function adequately. The latter, ninety-nine times out of a hundred, are poorly trained. Yet on them falls perhaps 99 per cent more responsibility than on the former. Most feeding in sickness as well as in health is done in the home. Mothers have at best indefinite ideas concerning the science of nutrition, but these ideas are second only to the indefinite dietary instructions given by many physicians. The development of the science of nutrition has made it necessary for the progressive medical man to be able to preach dietetics.

The author offers a summary of the subject. The volume begins with an interesting review of the developments that have evolved into the science of nutrition. Then follows a concise discussion of the principles of diet. These first two chapters are especially well written. They give an interesting summary and a criticism that leads one to expect to find something new in later chapters. Such a statement as, "In the management of constipation the old maxim, 'what is one man's food is another's poison,' is quite true. Bran may be excellent for one individual and irritate a colitis in another. The treatment must be individualized," makes one anxious to read further to learn about handling the individual problems presented by individual patients. The remaining chapters, covering about four hundred pages, fail to present the individualization.

Too much space is given to outlining menus, and occasional statements range far from accepted beliefs. Such didactic statements as, "The emptying time of the stomach in the short, stocky, obese or sthenic type of person is about four and one-half hours, whereas the emptying time in the long, lanky thin or asthenic type of person is about six and one-half hours; but six and one-half hours is abnormal for the sthenic individual and four and one-half hours is abnormal for the asthenic person," and, again, "pernicious anemia is a nutritional disorder believed to be caused by a deficiency of vitamin E," cannot fail to arouse a question in the mind of anyone who has had the opportunity to observe the emptying time of many stomachs and to follow many cases of pernicious anemia. The book fails to live up to the promise of the intensely interesting beginning because individual problems in dietetics cannot be solved in any book. Such problems can be solved only in the clinical management of the individual case. Information for the background for intelligent clinical dietary management is well presented in this book.

DAVIDSON.

TEXTBOOK OF HUMAN EMBRYOLOGY. By Cleveland Sylvester Simkins, Ph. D., Associate Professor of Anatomy, University of Tennessee Medical School, Memphis, Tenn. With 263 illustrations, some in colors, 469 pp., $4.50. F. A. Davis Co., Philadelphia, 1931.

This book is a fairly compact volume, considering human embryology, and referring to development of some of the lower species only where knowledge of the human is imperfect. It is intended primarily for students. As such it should be within the comprehension of the average physician, whose knowledge of embryology is admittedly scanty. The reviewer does not omit himself from this category. However, in describing development of certain organs of which he knows a little, the reviewer finds the book well abreast of the latest conceptions and clearly phrased. Illustrations are abundant and well selected.. A chapter on technic would be an excellent addition.

CEFALU.

THE TREATMENT OF BEHAVIOR DISORDERS FOLLOWING ENCEPHALITIS. An Experiment in Reeducation. By Earl D. Bond, M. D., Professor of Psychiatry, University of Pennsylvania, etc., and Kenneth E. Appel, M.D., Assistant Professor of Psychiatry, University of Pennsylvania, etc. 163 pp. $1.75. The Commonwealth Fund, Division of Publications, New York, 1931.

This book is an interesting and instructive account of an experiment in the treatmentof postencephalitic conduct disorders in children by reeducational methods in a special school connected with the Department of Mental and Nervous Diseases of the Pennsylvania Hospital in Philadelphia. Realizing from experience the impossibility of obtaining anything approaching satisfactory results with these problem children in a hospital with adults or in a hospital or school with normal children, a special Hospital School was organized in 1924 by Dr. Bond and his coworkers, who record in detail the result of their experiment.

The book opens with a brief sketch of the disease, en-

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cephalitis, follows with a composite history of sixty-two children before their admission to the school, then discusses the "struggle for a point of view." In the succeeding chapters the development of report between doctor and patient and their methods of influencing behavior are considered. The effects of treatment in the various cases are then interestingly described and the book closes with a chapter containing suggestions for the wider application of the hospital method, not only for postencephalitic conduct disorders but also for children with behavior problems resulting from other infections and from cerebral trauma.

The authors emphasize the fact that the behavior difficulties are most apt to occur between the ages of six and thirteen and the more severe the acute symptoms, the more likely are severe conduct deviations to follow. They did not include Parkinsonian cases or children over twelve in their group. In their hospital methods of influencing behavior the staff has not followed any single school in their psychologic approach but have used the theories of Adler, Thomas, Jung and Freud impartially, finding something helpful in each. Behaviorism, the need for affection, inferiority feelings, introversion, etc., were all found applicable to the understanding of the children's difficulties. In the final analysis of the results of treatment it was noted that thirty-five per cent of the children made good adjustment after leaving the hospital, comparing most favorably with the results obtained elsewhere and showing (as do also the British reports) that the best results occur in hospital units especially organized for the treatment of postencephalitic children.

The book is well and entertainingly written, pleasingly printed and not too technical to be readily understood by the laity. The reviewer heartily recommends it to all persons coming in contact with the postencephalitic conduct disorders of children. PRICE.

TABLES OF FOOD VALUES. By Alice V. Bradley, B. S., Supervisor and Instructor of Nutrition and Health Education, State Teachers College, Santa Barbara, Calif., 128 pp. $2.00. The Manual Arts Press, Peoria, Ill. 1931.

It is often necessary for a dietitian or nurse to calculate quickly the value of an individual's diet in an approximate way. Tables in this volume showing values of average servings will be helpful for such a purpose. Part I contains tables showing the food value of average servings or of convenient measures of commonly used foods. Part II presents tables showing the food value of 100-gram portions of commonly used foods. Individual tables consider breads, cereals, eggs, meat, fish, etc., Under cookies, for instance, is listed a great variety, for each of which is stated the weight in grams of proteins, fats, carbohydrates, and total calories, also the amounts of calcium, phosphorus and iron with the values of each as a source of vitamins. This volume is not only for the use of physicians but laymen who have occasion to consider the food values of different forms of food.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) VolumeI II, No. 4. (Mayo Clinic Number—August, 1931.) Octavo of 211 pages with 74 illustrations. Per clinic year, February, 1931, to December, 1931. Paper; $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

This volume presents many interesting reports from the large surgical staff of the Mayo Clinic. One notes particularly descriptions of operations on the digestive tract, including pharyngeal diverticulum, stricture of the common bile duct, ulcer of duodenum and stomach, gastrojejunal ulcer, cancerous cyst of sigmoid, gastrectomy, pylorectomy for hemorrhagic ulcer, adenocarcinoma of the colon and cecum. There are clinical reports of operations for intrathoracic goiter, epithelioma of the larynx, brain cyst and surgical procedures on other organs. A perusal of this volume will offer many useful suggestions in important operative measures.

THE PREVENTION OF SIMPLE GOITER*

The ease and simplicity with which goiter prophylaxis is accomplished has nearly been the undoing of this very valuable procedure, according to a recent statement by the United States Health Service. Many persons with goiter, attracted by the apparent ease with which the malady may be prevented, have concluded that what is useful for prophylaxis of the simple form is likewise efficient as a means of treating all types of the disease. Much harm has been done by this erroneous assumption. It is necessary, therefore, to caution people that there are certain goiters which are made worse by the ingestion of iodine. Moreover, the measures that may be effective in preventing simple goiter are in no wise useful in forestalling other and more severe forms of the disease.

The following questions quite naturally arise regarding simple goiter: First, why should simple goiter be prevented? Second, is the condition more than a deformity of the neck? These reasonable questions may be answered by citing the experiences of certain foreign countries in which the disease prevails unduly. When unchecked, simple goiter is often associated with mental and physical degenerations, especially deaf mutism, feeblemindedness and the idiocy of cretinism. The ill effects of uncontrolled goiter are particularly severe in subsequent generations. Fortunately, the affection has not reached this degree of intensity in the United States, nor is it likely that it will reach it.

The causes of simple enlargement of the thyroid gland may be conveniently classed as immediate and remote. The immediate cause of this condition is now believed to be a complete absence or marked deficiency of the iodine necessary for the normal function of the gland. Anything which interferes with the intake or utilization of iodine available in normal quantities may likewise cause enlargement of the organ. Thus, infections, intoxications, faulty diets and such periods of stress in female life as puberty, pregnancy or the change of life may be mentioned as remote or underlying causes of simple goiter. It is a matter of common knowledge that females are more prone to simple goiter than are males.

The most satisfactory method of administering iodine for the prevention of simple goiter is by adapting the remedy to each person in need of it. In this way accurate dosage and nominal supervision is insured. Obviously this method is costly and cumbersome, reaching only a small portion of those requiring the protection. In order to overcome these objections, wholesale prophylaxis by the use of iodized table salt and iodized water supplies has been suggested. While both of these methods are theoretically sound, it is not yet definitely known whether they are effective and, at the same time, incapable of causing harm to persons with existing goitrous enlargements. Therefore, the individual method is preferable at the present time.

It is likely that the regular consumption of foods naturally rich in iodine will aid in preventing goiter. It is known, for instance, that marine algae, deep sea fish and crustaceans are particularly rich in iodine. But here again the uncertainty of dosage is economic factors are involved. Variations in the iodine content of food and water probably account, to a considerable extent, for the differences in goiter incidence in the United States.

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* Issued by the United States Public Health Service, Oct. 10, 1931.

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ACUTE THROMBOTIC OCCLUSION OF THE CORONARY ARTERIES*

Charles R. Austrian, M. D.
BALTIMORE, MD.

For many years clinicians were accustomed to see prolonged attacks of stenocardia and designated such states "status angiosus," but they failed to correlate them definitely with an acute closure of the coronary arteries until comparatively recent times.

Although many excellent articles that deal with the subject of coronary thrombosis are available, and although no fundamentally new facts are to be presented, a recapitulation of the present knowledge of this condition is undertaken on this occasion for several reasons. First, experience indicates that the condition is not recognized now and again, even when the evidence is clear, and that it is confused at times with other morbid states because the picture that it presents may resemble them so closely that only detailed information can lead to a proper diagnosis. Second, to point out that, although the electrocardiograph and other accessory methods may be needed in some cases finally to demonstrate an interference with the arterial circulation of the heart, as a general rule, a careful physical examination, interpreted with proper regard for an intelligently collated history, will suffice to lead to a correct conclusion.

The statements to be made are based on a review of the literature and on an analysis of the records of 89 patients with coronary thrombosis, 56 of whom were seen in consultation outside of the clinic and 33 at the Sinai Hospital. The diagnoses were based on clinical data but only those cases were included in which the accuracy of the conclusion was beyond any reasonable question.

There is no known specific etiologic factor responsible for the development of an acute occlusion of a part of the coronary circulation. A history of antecedent infections is obtained no more frequently than it is from any other class of adults and the incidence of localized foci of infection is no greater in one group than it is in the other. In this series of patients 10.7 per cent had had typhoid fever but from this finding no conclusion is warranted. Further analysis of these patients confirms the observations that the rheumatic cycle does not seem to favor the development of the condition; that syphilis in spite of its predilection for the aortic area, near or about the ostia of the coronary arteries, is not of etiologic importance except, perhaps, occasionally in those patients who develop an acute occlusion before the middle of the third decade of life, and that acute infections do not precede or accompany regularly the development of the thrombosis.

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* Read before the Ninth Annual Meeting of Pacific Northwest Medical Association, Seattle, Wash., June 26-27, 1931.

It is interesting, though perhaps not significant, that in our series there were fifty-eight Jews and thirty-one non-Jews, a finding that calls to mind Parkinson's analysis of one hundred cases of cardiac infarction which included forty-three Jews. Whether or not the Jew is more likely to develop coronary occlusion than is the non-Jew cannot be stated as a fact, but the greater liability of the former to angina pectoris seems to support the suggestion of these figures. But even if this proved to be a fact, a racial predisposition could not be considered to be established, but rather the tendency of individuals who are tense, hard-working, neurotic and given to overindulgence in eating to develop cardiovascular disease would be emphasized.

The etiologic significance of heredity in the causation of this type of vascular disease has not been proved but some data suggest that its role may be an important one. In forty of the eighty-nine cases, some member of the family had had hypertension, apoplexy, nephritis or cardiac disease. In three, one or more had developed a coronary occlusion. Undoubtedly these figures are inaccurate, for precise information was not obtainable in each case, and the chromosomal influence may be more regular than the recorded facts indicate.

Bodily configuration has seemed to us of relatively little importance in spite of the established higher incidence of vascular disease in those who are relatively obese after the age of forty. Statistical studies, however, indicate that the typical patient is well developed and slightly overweight. Tense, hyperkinetic, worrisome individuals who have had much nervous and mental strain seem more prone to develop the malady than do those who are more phlegmatic, even though they have done much physical work.

The precise relationship between the occurrence of angina pectoris and the subsequent development of coronary thrombosis is in doubt. Many consider the latter the end-result of the former and Levine states that this is so generally. Perhaps this statement is true in the main in those cases in which the attacks of stenocardia were due to disease of the coronary arteries and not to functional circulatory disturbances, the result of some infectious or metabolic disorder. The frequency with which thrombosis is preceded by anginal symptoms is difficult accurately to determine. The subjective disturbances may have been trivial and forgotten, the patient may have been hyposensitive to pain, and as Libman has emphasized, dyspnea may have been the expression of his anginal syndrome; the pain may have been interpreted as of extravascular origin, and finally, a satisfactory history may be wanting either because the patient was too ill to give it or the questioner may have failed to regard slight complaints in their true light. Undoubtedly, in some cases, the acute closure of the vessel is the first evidence of cardiac disease. According to Connor, 38 per cent of his cases had had an antecedent angina of effort; a group of statistics published by several authors gives the incidence as about 30 per cent and in this series of cases it was 48.3 per cent.

It would seem logical to assume that in those diseases, in which the cardiovascular system is affected generally, the incidence of disease of the coronary vessels would be high. It is interesting, therefore, to note the occurrence of coronary thrombosis in association with diabetes, hypertension, arteriosclerosis and thromboangiitis obliterans.

According to many authors, arterial hypertension is an important predisposing factor in the development of coronary thrombosis, although an exact incidence of the relationship between the two cannot be determined readily. The existence of the elevation of blood pressure may not have been known because no examination was made; the hypertension may have caused no symptoms and at the time of the acute illness the collateral evidences of an antecedent elevation of pressure may be inconclusive. Parkinson and Bedford estimated that an association existed in 49 per cent of their cases, Levine noted it in 40 per cent, whereas Connor has the impression that coronary thrombosis is almost as frequent among those with low as with high blood pressure. In this group of patients the pressure was known to have been elevated in 39 or 43.8 per cent, and normal before the attack (below 140 systolic) in 18 or 20.2 per cent. In a general survey of the twenty-eight patients, whose antecedent circulatory status was unknown, data were insufficient to prove they had been hypertensive. It may perhaps be assumed that some of the latter had pressures higher than normal and, therefore, the predisposing influence of hypertension may be more real than the actual figures indicate. The relationship of arteriosclerosis is even more difficult to ascertain because of the fact that some degree of arterial degenerative change is so usual in the decades in which coronary occlusion occurs. Suffice it to say, although now and again intermittent claudication and manifestations of cerebral arteriosclerotic disease are met with, most of the patients showed negligible changes in the peripheral vessels. The association of thromboangiitis obliterans with coronary disease has been pointed out by Libman and its presence was noted three times in this series.

Connor does not consider diabetes mellitus an important predisposing factor, for in his cases there was an associated incidence of only 10.2 per cent. Klotz reported the coexistence of the two maladies in 20 per cent of forty-four cases examined postmortem and in this series it was noted in nine cases, 10.1 per cent. Levine concludes "that among the distinct disease entities that are etiologically related to coronary thrombosis, diabetes is second in importance only to a preexisting hypertension," but he points out also that the presence of diabetes did not alter the prognosis of the attacks of coronary thrombosis nor the age at which they occurred, and this observation "leads one to feel that it had no causative influence in the disease of the coronary arteries but merely indicated the type of person who had a vulnerable vascular system."

Practically all recorded statistics indicate that the disease occurs more often in men than in women. In Connor's cases men were affected five and a half times as often as women; in Levine's analysis the ratio was almost three and a half to one, and in our experience it was one and a half to one. The factors responsible for the greater susceptibility of the male sex are undetermined but stress, physical and mental, and the use of tobacco have been thought to be possible determinants.

Acute coronary thrombosis occurs most frequently in middle and advanced age and our observations are in accord with many others in that they indicate the maximum incidence is between the ages of sixty and sixty-nine years. According to Connor, the frequency increases gradually from the third decade on and, though most cases have their first attack between the ages of forty and sixty, in women the initial symptoms occur more often in the fifth decade and a larger proportion are affected in the later years of life. In two of our patients thrombosis developed in the third decade; in sixteen between forty and forty-nine; in thirty-one between fifty and fifty-nine; in twenty-six between sixty and sixty-nine; in thirteen between seventy and seventy-nine; and in one in the eighth decade.

SYMPTOMS AND SIGNS

The clinical manifestations of acute coronary occlusion vary greatly and are very characteristic except in those instances in which death occurs instantaneously and in those in which the signs and symptoms are atypical. The typical attack of average severity develops abruptly in an individual in or past middle life who may or may not have had previous symptoms of angina pectoris. If he belongs to the latter group, he may recognize at once that the seizure is different from those suffered before. The attack is as likely to occur when he is at rest, particularly during or after eating, as it is in the course of physical activity. Generally, pain is the initial manifestation — severe, crushing, binding or constricting in character. It is usually thoracic or epigastric and is either localized or radiates into the arms, the neck, the back or the face, usually on the left side, though occasionally the radiation is to both sides, or as Libman pointed out, to the right one only in those who are hyposensitive to pain. Nausea and vomiting are such constant concomitants of the pain that some digestive disturbance may seem to be the cause of the distress. Motor restlessness, anxiety, depression, great weakness and evidences of shock accompany the pain that lasts for hours or even days unrelieved by the usually employed measures and even by massive doses of opiates. The cold, clammy skin and its ashen gray appearance, the prostration and apprehension, the small rapid pulse, low blood pressure, feeble heart sounds, abnormal cardiac rhythm and in some cases the pericardial friction, the rapid or at times periodic breathing, the slight elevation of temperature and the promptly developing leucocytosis complete the picture. Death may occur at any time after the onset of the symptoms with or without manifestations of congestive cardiac failure, or improvement and recovery may be the outcome of such an attack.

The character, location, radiation and duration of the pain are very variable. Although often agonizing and indescribable, it may be no more than a dull thoracic, cervical or brachial ache. As a rule, the maximum severity is at the time of onset and gradually in the course of hours or days it lessens and disappears. Unlike the pain of angina pectoris, it is influenced little by physical activity and the tenacity with which it persists in spite of the administration of morphine is noteworthy. Most typically it is midthoracic and substernal or precordial, but it may be limited to almost any part of the thorax or upper abdomen.

The cardiac signs seem oftentimes relatively slight when contrasted with the peripheral evidences of circulatory weakness. Examination of the heart may fail to locate a visible or palpable apical impulse and the cardiac dullness may be increased, but the significant changes are the enfeeblement of the heart sounds, the alterations of rhythm and the presence of a pericardial friction rub. The rate is usually accelerated. The sounds, especially the first one at the apex, are muffled and distant and the two sounds are very alike in quality. In the majority of cases the most constant finding is a tendency to a three-time rhythm or a true gallop rhythm, generally of protodiastolic type that may be present constantly or only at times. It is present in nearly every patient with an acute coronary thrombosis, at least during the period shortly after the closure has occurred, and is heard best just median to the apex or along the left margin of the sternum. Now and again the area over which it is audible is a very limited one.

It has been a generally recorded observation that coronary thrombosis occurs almost invariably in individuals whose cardiac rhythm was previously normal and the rarity with which it develops in those who have auricular fibrillation has been pointed out. However, when a thrombus has occluded some part of the coronary arterial tree, one or more of many types of irregularity may follow. Premature beats, ventricular or auricular, occur in many cases; heart-block of different degrees of completeness is not infrequent, although the complete interference with auriculoventricular conduction is seldom encountered; auricular fibrillation develops often in paroxysms of short duration and ventricular tachycardia is a rare sequel. None of these disturbances of the cardiac mechanism is of especial prognostic importance except heart block and ventricular tachycardia which are generally of ill omen. A systolic murmur, apical, basal or best heard over the precordium develops in many cases, but diastolic murmurs are a rare occurrence unless there has been an antecedent valvular lesion. Whether or not, as Levine asserts, a previously established mitral stenosis lessens the probability of the development of coronary thrombosis, certain it is that such a coincidence of lesions is rarely met.

Any extensive survey of patients with cardiac disease indicates the wisdom of attributing myocardial failure that develops abruptly without apparent cause to disease of the coronary arteries. There are many instances in which pain is absent and dyspnea seems to be its equivalent, with or without pulmonary edema, and yet it is not the rule to see marked evidences of congestive failure accompany or develop immediately after an acute thrombotic occlusion of a coronary artery. Cyanosis, dyspnea and rales at the bases of the lungs are constant developments but peripheral edema generally is a later manifestation. A very rapid enlargement of the liver suggests obstruction in the right coronary circuit. When recovery follows the acute episode, there may be sufficient permanent myocardial damage so to impair the cardiac reserve that the typical picture of failure will develop and properly to interpret the origin of these subsequent symptoms, a carefully taken history and an electrocardiograph may be needed.

Undoubtedly, it is a fact that when a pericardial friction rub develops, it is a confirmatory diagnostic sign of cardinal importance. The frequency with which this finding has been noted is very variable. Referred to in this connection first by Dock in 1896, its significance was stressed by Gorham and its importance has become appreciated generally. Levine noted it in about 13.8 per cent of his cases, and it was present in 16 per cent of our series. Beyond question the incidence of pericarditis is more frequent than these or other analyses indicate, for generally the friction rub is heard over a very limited portion of the precordium, its intensity varies from hour to hour and it may be very evanescent. Moreover, if the area of myocardial infarction is limited to the interventricular septum or to the inferior or the posterior portion of the ventricular wall, or if it extends toward the inner rather than to the pericardial surface of the heart, no friction sound may be detectable. The latter reasons make it clear why the absence of a friction rub over a large part of the precordium does not warrant an inference as to the extent of the myocardial softening. The pericarditis is usually of the fibrinous type and only once have we observed the development of a large effusion into the pericardial sac. It does not usually cause any pain or other subjective symptoms.

One of the most constant concomitants of acute coronary thrombosis is a fall of blood pressure, even when it was not abnormally high before the attack occurred. The decrease may be abrupt or gradual, slight or marked, transitory or prolonged, and in any event it is progressive as a rule for at least several days. The actual fall is greatest when there was an antecedent hypertension. Generally, both the systolic and the diastolic levels are lowered but in some cases the former is altered more than the latter with a resultant diminution of the pulse pressure. Now and again the preexisting level is never reattained after complete recovery, and anginal pain that occurred before may cease to recur. Although as a rule an elevation or a maintenance of the usual level of blood pressure speaks against a coronary occlusion and in favor of angina pectoris as the cause of stenocardia, in exceptional instances a rise of tension has been observed, when coronary thrombosis developed and this was noted in two of this series. If another attack occurs or if myocardial failure develops, another decline of the pressure ensues.

Of the objective systemic signs helpful to differentiate coronary thrombosis from angina pectoris perhaps none is more constant or more readily recorded than are fever and leucocytosis. An elevation of temperature, generally slight or moderate, develops within a few hours and endures for a variable period. Although a marked pyrexia is not the rule, several patients have been observed whose temperature rose abruptly to 104° F. and remained at or near that level for some time. As a rule, fever is present for several days to a week or more, but when it is protracted, in the absence of other reasons for its persistence, it may signify extensive myocardial infarction. Now and again, the temperature may not rise above the normal level but it must be emphasized that the absence of fever has not been proved unless the temperature has been determined by rectal thermometry. The febrile reaction is attributable to the necrosis of the myocardium or to the infarction of tissue in other organs as the result of embolism.

A leucocytosis may be demonstrable within an hour and a quarter after the occurrence of a coronary thrombosis, according to Libman and Saks, and to the former is due in large measure the recognition of the value of this finding. The increase of the white corpuscles may parallel roughly the febrile reaction and is generally moderate, so that the count averages between 12,000 and 20,000, with an exceptional rise to 25,000 per cubic millimeter. The polymorphonuclear elements are affected chiefly. The leucocytosis may persist as long as the fever and, like it, may have prognostic significance. Invaluable as an aid to differentiate between angina pectoris and acute coronary thrombosis, the increase of the leucocytes helps further to confuse the problem, when there is need to decide between a cardiac and an abdominal origin of epigastric pain, vomiting and evidences of peritoneal irritation.

The only significant evidence of renal dysfunction may be a temporary suppression of urine, secondary to the fall of blood pressure and the state of shock. Levine and Brown state that "glycosuria is a common occurrence during the acute stage of coronary thrombosis, that it may be transitory, and that it need not indicate any important diabetic state." In our experience, glycosuria apart from a preexisting diabetes and hematuria, except when renal embolism has occurred, are unusual events. Albuminuria and cylindruria are regular findings in the febrile stage of the illness and when there was a renal lesion before the acute episode.

The pathologic changes that follow when a portion of the myocardium is deprived of blood are such that the occurrence of embolism is to be expected. If the infarction of the heart wall extends to the endocardium, mural thrombi form and, depending upon the site of such thrombosis—right or left ventricle-emboli may be discharged into the pulmonary or the systemic circulation. It cannot be determined from the site at which the emboli lodge whether the right or the left coronary artery was occluded, for each artery supplies a part of both ventricles and of the interventricular septum, hence closure of either artery may be followed by thrombosis in either ventricular wall. It is surprising that embolism does not occur more frequently than it does. Emboli may affect single or multiple parts of the body and may be serious or trivial. Fatal cerebral, pulmonary or renal infarction occurs in some cases but we have seen recovery follow the lodgment of emboli in the cerebrum, in both of the lungs, kidneys and in the spleen of one individual. Levine made the pertinent observation that the occurrence of a sudden hemiplegia, in the absence of a significant hypertension or of syphilis, should suggest consideration of embolism from a mural thrombus, the result of a coronary occlusion, as a likely cause of the accident.

Correctly to diagnose the occurrence of coronary thrombosis requires not merely familiarity with the manifestations of the condition, but a careful critical analysis in every case to differentiate it from other maladies that may give rise to very like ones. Among these, angina pectoris is first in importance. In the latter syndrome the pain induced by exercise, emotion or by eating is often less severe, of shorter duration and is relieved by nitrites or by average doses of morphine. The absence of evidences of shock, the maintenance or elevation of blood pressure, the lack of fever and of leucocytosis, of pericarditis, of cardiac arrhythmia and of embolism and the preservation of myocardial compensation suffice generally to exclude thrombosis. The electrocardiograph may afford helpful evidence in some cases.

In patients during middle age, severe epigastric pain with nausea and vomiting demands consideration of coronary thrombosis as the possible cause of it. A history of antecedent anginal attacks, the radiation of the pain to the sternal region, into the arms or neck, dyspnea and cyanosis, altered cardiac rhythm and enfeebled heart sounds may indicate the circulatory origin of the symptoms, but the febrile reaction, leucocytosis or infrequently jaundice, the abdominal rigidity and even muscle spasm may still lead to an erroneous conclusion and unnecessary or hurtful treatment of suspected biliary calculus, ruptured duodenal or gastric ulcer, acute pancreatitis, etc. Even with full knowledge, error may be unavoidable, though perhaps an electrocardiograph may now and again establish the truth in time. There has been at least one occasion in our experience when decision was impossible and as it seemed better to learn in the operating room than at the postmortem table, operation was done, happily without hurt to the patient.

Although the pain is different in site, severity and relation to respiratory effort, although chill is less frequent and polypnea less marked, now and again a diagnosis of pneumonia may be suggested, especially when basal rales are numerous or the early signs of pulmonary infarction are detected. In such cases generally the history and the collateral evidences will clarify the problem.

Particularly difficult to recognize are the cases with very mild and atypical symptoms, in which perhaps the occlusion of a large or of many smaller vessels develops gradually and local necrosis of the myocardium develops without any sudden abrupt cessation of the local circulation. In such patients, the symptoms are considered the result of ordinary myocardial degeneration and the coronary origin of the change is unsuspected unless the history arouses the proper suspicion or embolism occurs. In this group particularly, dyspnea may be the equivalent of pain; therefore, it is wise, whenever congestive failure develops suddenly and without evident cause, to suspect impairment of the coronary circulation as the basis of the myocardial embarrassment.

Undoubtedly, at this time, even with all the available clinical knowledge, many instances of acute thrombotic closure of the coronary vessels will escape recognition, but if the condition is borne always in mind and if data gleaned at the bedside are correlated with the evidences furnished by the electrocardiograph, these will be fewer.

The helpfulness of the string galvanometer cannot be gainsaid, though it is difficult to subscribe to an evaluation that states "objective analysis of a record does not necessarily require any acquaintance with a patient's clinical history; indeed, symptomatology and pathology of the disease may often be read from the record itself. As the pathologist, in viewing a microscopic section of the kidney, can reconstruct a probable picture as to the cause of the disease previous to death, so the cardiologist is able, from an intelligent analysis of the electrocardiogram, to state the probable pathologic changes existing during life and to outline the probable signs and symptoms which characterize the cardiac affection. Indeed, he can often go farther and predict the probable clinical course which the disease will follow."

Inasmuch as the significant electrocardiograph evidences of coronary disease have been discussed by Dr. Dock, let it suffice briefly to state that the electrocardiograph enables the examiner to determine the precise character of a cardiac arrhythmia or of a tachycardia, to detect changes of cardiac mechanism not readily discoverable by other means and to prove the presence of bundle branch block. In my judgment, this method of study, invaluable in the investigation of cardiac dynamics and needed to increase the understanding of cardiac disease, is seldom a *sine qua non* for the practitioner who, if trained properly, can recognize even bundle branch block and paroxysmal ventricular tachycardia with the five unaided senses. King has shown that a reduplicated impulse visible and at times palpable at the apex of an enlarged heart, a feeble and reduplicated first sound at the apex with or without a systolic murmur or the reduplication of both sounds indicate the existence of the former. Levine has observed that tachycardia uninfluenced by vagal stimulation, interrupted by a slight pause at times, and by a variation in the intensity of the first sound at the apex with a sudden clicking or reduplication with some cycles, establishes the occurrence of the latter.

PROGNOSIS

Inasmuch as sufficient statistical data are not available, no specific criteria have been established that are surely indicative of probable death or recovery after the occurrence of a thrombosis of a branch of the coronary arterial system. Certain generalizations, however, may be made. The severity of the initial pain is not a reliable prognostic guide but the degree and the duration of the collapse are more significant of the gravity of the outlook. If the blood pressure falls below eighty millimeters of mercury, if there is prolonged unconsciousness or marked delirium, recovery is less frequent than when these symptoms do not develop. Fever and leucocytosis, regarded as indices of infarction of the myocardium, and pericarditis are not as reliable prognostic criteria as theoretical considerations would indicate they should be, and even the degree of cardiac dilation is not a sure guide. According to assembled statistics, the occurrence of extrasystoles and of auricular fibrillation have little influence on the development of ultimate recovery but heart-block and ventricular tachycardia are bad omens. Favorable indicators are a gradual rise of blood pressure, improved quality of the cardiac sounds and a restoration of normal rhythm.

The immediate mortality of acute coronary thrombosis is thought generally to be about 55 per cent but this is not an accurate figure, for undoubtedly only the more severe cases are recognized, many mild attacks are undetected and the cases that lead to imediate death are not seen. The outlook is better in younger individuals; 66 per cent of our cases below fifty years recovered and only 39 per cent of those over fifty years survived. The average duration of life after an attack could not be determined accurately in our series. One lived eight years and died of erysipelas, one is alive and well more than five years after an attack, two lived more than four years and three are still alive after two years, and it seems that the average of all of those studied would be around two and a half years with the extremes between a month and ten or more years. Among those who came through the acute attack, the duration of health was longer in those who were younger than it was in the older group. Two of our series have survived two attacks, and similar cases have been reported by others.

The prognosis was the same for women as for men and the period of survival was the same for the two sexes. Syphilis and diabetes did not seem materially to influence the immediate outlook. Of those known to have had high blood pressure, 65 per cent did not survive the first attack, whereas of those whose tension was normal 42 per cent died. Although the anatomic studies of Gross would indicate the probability of the establishment of a collateral circulation in older individuals, and although it might be assumed on theoretical grounds that antecedent anginal attacks were indicative of the possible formation of anastomotic channels as a compensatory mechanism, the mortality was higher in these groups of patients. In Connor's series, of those who had a history of angina of effort, 24 per cent died in their first attack of coronary thrombosis, whereas of those who had no such record only 16 per cent succumbed. In this series, the mortality during the acute attack was approximately the same in these two classes of individuals, 64.2 per cent of the former and 50 per cent of the latter.

In one group of patients death occurs instantly and in another the end comes suddenly at a variable period after the onset of the symptoms of thrombosis. In both of these there is experimental evidence to suggest that ventricular fibrillation is the cause of the lethal outcome. In many cases, general circulatory failure precedes death and explains the lethal result and at times heart-block develops. Sudden death between the end of the first and the second week of survival may be due to a rupture of the infarcted area of the heart, to embolism, to ventricular fibrillation, to heart-block or to congestive failure. In some patients after recovery from an attack of coronary thrombosis, anginal attacks that were severe before the acute episode cease to occur, even when the patient has resumed his activities, and a hypertension may be relieved permanently. Still other patients continue to have anginal attacks, or may have them for the first time. Most patients who survive thrombosis of a coronary artery develop subsequently evidences of myocardial failure with or without arrhythmia or have one or more thrombotic accidents at a later date.

The diagnostic and prognostic difficulties will be understood better if certain anatomic facts are reviewed. The myocardium receives its supply of blood through the coronary arteries. The right coronary artery arises from the aorta just below the right anterior cusp and supplies the entire right ventricle except the left third of its anterior wall, the right half of the posterior wall of the left ventricle and a small portion of the interventricular septum. The left coronary artery starts in the left anterior sinus of Valsalva below the level of the edge of the aortic cusp, and soon divides into the anterior descending branch and a left circumflex branch. The left coronary artery supplies all of the left ventricle except the right half of the posterior wall, the left anterior portion of the right ventricle and a small anterior strip of the interventricular septum. Both arteries carry blood to the remainder of the septum and to the papillary muscles. Branches of both vessels are distributed to the epicardial fat and form numerous anastomoses that increase with advancing age.

The anterior descending branch of the left coronary is the vessel involved in more than seventy-five per cent of those individuals in whom coronary occlusion occurs. Abundant anastomoses exist between the right and left arteries but these are insufficient to prevent the development of infarction when a large trunk is occluded. Although the coronary vessels are arranged usually in the way indicated, anatomic variations are numerous, hence the structural changes in the myocardium will differ in site and in degree, depending upon the vessel occulded and upon the arrangement in the individual. According to Gross, a branch of the right 60 per cent and the auriculoventricular node in 92 per cent. The right limb of the bundle is nourished by the left coronary artery, the left limb by branches from both arteries.

From these facts it is easy to understand why emboli may be distributed in the systemic circulation, when a branch of the right coronary artery is occluded or in the pulmonary circuit when the left artery is thrombosed; why the occurrence of arrhythmias and of heart block is so variable and why a closure of the corresponding vessel in different individuals may have such dissimilar consequences, dependent as they will be upon the different anatomic distribution of the vessels and the extent of the anastomotic channels in a given case. Further, the role played by the Thebesian vessels described so well by Wearn introduces another variable, for consideration of these small vessels opening directly into the chambers of the heart and connecting directly with the coronary capillaries and veins may be useful when the regular blood supply of the heart muscle is interfered with.

From the nature of the pathologic process in coronary thrombosis, it is evident that treatment will be directed toward the alleviation of symptoms, the preservation and restoration of cardiac reserve, the prevention of embolic accidents and, if recovery from the attack ensues, so to order the patient's life as to prevent a recurrence of an acute episode.

TREATMENT

Whether the onset of the attack is dramatically abrupt or is more gradual, the immediate indications will be to relieve pain, to lessen shock and to give rest with relief from apprehension. Allowed to assume in bed that position in which distress is least, the patient is given a hypodermic injection of morphine without any avoidable delay, and this treatment should be repeated at short intervals until the pain, agitation and restlessness are lessened or abolished unless toxic manifestations, such as depression of the respiratory center, warn against further administration of the drug. It is equally true as a rule that just as the nitrites and other vasodilators are impotent to alleviate the dolor pectoris in this state, so are the doses of opiates required ordinarily to control it, a fact of suggestive diagnostic worth. In our experience, an initial injection of a quarter of a grain needs be followed by two or more injections of like amount before some relief is apparent. Milder analgesics or sedatives, such as codeine, dionine, etc., are without effect and chloral, bromides, sulphonal, etc., are not sufficiently potent. To overcome the evidences of shock, warm coverings, hot pads or bags are of value and, unlike stimulants, are never hurtful. The latter, including such drugs as caffeine, strychnine, adrenalin, camphor, etc., are double-edged weapons and in the acute stage of the disease may be more harmful than helpful, or are entirely without effect. Perhaps occasionally caffeine may be administered to minimize the depressing action of morphine on the respiratory center.

Dyspnea, anoxemia and cyanosis may be lessened by placing the patient in an oxygen tent.

After the initial symptoms have subsided, the signs and symptoms in individual cases will determine what measures are to be taken in the succeeding days. Inasmuch as there is generally no significant arrhythmia and evidences of myocardial decompensation are lacking at first, the giving of digitalis is rarely indicated at this time, but should there be signs of cardiac failure, digitalization is in order, for within the first days after coronary occlusion there is little danger of cardiac rupture or of embolism. The safety of this treatment, after there has been time for myomalacia and mural thrombosis to develop, is questioned by some observers, for it may favor the occurrence of fatal ventricular fibrillation, of rupture of the heart or of the discharge of emboli into the circulation, but as in the earlier days of the illness the efficiency of the myocardium should determine whether or not digitalis is to be administered. If there is pulmonary edema, atropine in sufficient amounts may suffice to help overcome it.

If signs of congestive failure ensue after two or or three weeks, and they are most likely to develop at this time, they call for the treatment given ordinarily for cardiac decompensation—digitalization, venesection, atropinization, restriction of the intake of fluids and of salt, etc. Active purgation, however, is to be avoided. To overcome heart-block with or without Stokes-Adams syndrome, atropine or barium chloride may be administered but neither the latter nor adrenalin has been very helpful in our experience and the latter may be positively harmful. Paroxysmal ventricular tachycardia calls for quinidine and auricular fibrillation, that is not very transitory, may require digitalis in addition.

But, however valuable given drugs may be to tide over limited periods of stress, the cardinal measures upon which reliance is to be placed are rest in bed for a minimum of six or eight weeks, during the first of which the patient should be in as nearly a vegetative state as possible. Reassurance is brought about not merely by the spoken word but by the calmness of those about the sick-room and is necessary to lessen mental stress. The exclusion of visitors, the avoidance of reading, of discussions and of arguments and the elimination of all but the necessary examinations is desirable for some days. The attendant should assist, whenever the position in bed is to be changed, and should actually feed the patient. The diet during the first few days should be restricted to milk and subsequently soft bland articles of food may be given. The intake of fluid need not be limited unless there are signs of retention of chlorides and of water. For forty-eight to seventy-two hours catharsis should be avoided and thereafter mild purgatives supplemented by enemata will prevent straining during defecation that may tax the circulatory mechanism. When the period of absolute rest nears an end, general massage thrice weekly is useful to restore muscular tone.

When convalescence has been well established, a gradual resumption of a more or less restricted mode of living is in order, and the future course of activities needs be carefully charted so as to indicate specifically what physical and mental exertion is not likely to impose a strain on the reserve cardiac power and what may be hurtful. The desirability of avoiding the use of alcohol and of tobacco and of removing factors that may impair the general health are to be noted. Subsequent evidences of myocardial weakness demand the curtailment of physical effort to the required minimum and the administration of digitalis in conjunction with the measures that are employed, whenever this state is encountered.

If anginal attacks are residual manifestations or are a sequel, nitrites and iodides may be given or theophylline ethylene diamine may be administered alone or in combination with diuretin. The former of these derivatives of xanthine has been shown appreciably to increase the circulatory flow of the coronary arteries and it should prove to be a valuable therapeutic adjuvant. It may be given over long periods of time without a deleterious effect upon the renal function.

Doubtless with increasing experience, the diagnosis of abortive cases, more accurate prognosis and the institution of preventive measures and better therapeutics will result.

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A PRACTICAL CONSIDERATION OF THE SURGICAL DYSPEPSIAS*

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Perhaps the most common chief complaint registered by patients presenting themselves for diagnosis and treatment of chronic gastrointestinal disturbance is "stomach trouble," less commonly called dyspepsia. It is this group of so-called chronic dyspepsias which often tax to the utmost our diagnostic acumen. One's primary duty in the diagnosis of the chronic dyspepsias should be an early and precise localization and possible exclusion of organic disease in the gastrointestinal tract and accessory digestive organs, since the cure of malignant disease and the prevention of disability arising in nonmalignant pathology demands early diagnosis and early treatment. Before rational treatment can be recommended, the clinician must next discover or exclude pathologic lesions extrinsic to the digestive field. Extrinsic disease may have a direct bearing upon the syndrome in question, or its presence influence treatment employed. There is also the necessity to evaluate the present and future menace to efficiency and even to life of existing pathologic causes for dyspepsia, and to balance the nature of the pathology and clinical syndrome against available remedial measures.

For the purpose of discussion, this paper will deal only with those chronic dyspepsias which are frequently seen by the general practitioner and surgeon and to point out some points of practical importance in diagnosis and treatment. This message is particularly directed to those who find themselves compelled to make most of their diagnoses of the surgical dyspepsias without the help of trained roentgenologists, elaborate clinical laboratory equipment and all the aids which are at one's command in a large teaching hospital. It is for their encouragement that I wish to state that a good history, well taken, is still the most important factor in the diagnosis of the dyspepsias of both intrinsic and extrinsic origin. It is true that, when a good history is followed by a careful physical examination and later by a test-meal and roentgenologic examination, the latter two methods decrease the margin of error, but they cannot be considered short-cuts to accurate and careful diagnostic methods.

The average history taken during the course of a busy practice is often too short and incoherent. Such a history will suffice for minor complaints, in which the cause is obvious or in conditions in which differential diagnosis does not feature as an indication for or against surgical treatment. There is nothing more satisfying, however, than to begin with a chief complaint of dyspepsia or "stomach trouble" and complete a history which fits a definite syndrome of the chronic dyspepsias, and be able to verify the clinical history by physical examination, test-meal and roentgen examination, and later at operation. A diagnosis then becomes an inductive reasoning process, in which the facts obtained from the patient, the laboratory and the roentgen examination are considered in the light of accumulated experience and builded into a rational syndrome.

Before the development of roentgen-ray experience, Graham[1] claimed an accuracy of about 80 per cent in his diagnosis of the dyspepsias, whereas Carman in his prime had been able to report a roentgenologic accuracy of 98.2 per cent in cases checked at operation. While a Fellow in Surgery at the Mayo Clinic under Eusterman, I was curious to know how a student of average clinical acumen would fare, attempting to make a diagnosis on history and physical examination alone and checking this against laboratory evidence and roentgen-ray findings. A card index file was kept on which were recorded the diagnosis after history and physical examination were completed. The chart will demonstrate the result (chart 1). A comparison of the average age incidence of the various dyspepsias is also of interest as well as the test-meal findings frequently encountered, since they aid in clarifying certain fundamental differences (charts 2 and 3).

The grouping of clinical phenomena into definite disease syndromes may be considered arbitrary but has distinct practical value in coordinating the anticipated pathology with that found at operation. This follow-up procedure tends to purify these syndromes and aids in giving the patient the benefit of the cumulative experience gained in a study of each syndrome.

To be able to more concretely discuss some of the practical features encountered in the diagnosis and treatment of the surgical dyspepsias, I shall arrange them into the accepted syndrome for discussion, using McVicar's[2] cryptic outlines for each.

The peptic ulcer syndrome is perhaps the purest one of all encountered in the surgical dyspepsias.

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* Read before a meeting of Southern Oregon Medical Association, Ashland, Ore., May 12, 1931.

[1] Graham, C.: Peptic Ulcer and Gallstones in Upper Abdominal Diagnosis. Colo. Med., 15:34-41, 1918.

[2] McVicar, C. S.: Diagnosis in the Chronic Dyspepsias. Canad. Pract., 48:137-151, Apr., 1923.

COMPARISON OF CLINICAL HISTORY WITH ROENTGENOLOGIST'S FINDINGS

		Clinical and X-ray Diagnosis agree		Clinically negative		Clinically positive	
Date	Number cases	Number	Per cent	X-ray Number	Positive Per cent	X-ray Number	Negative Per cent
January-June, 1923	33	25	75.7	3	9.9	5	14.1
January, 1924	42	36	85.6	1	3.3	5	11.9
February, 1924	48	37	77.0	5	10.4	6	14.5
March, 1924	52	47	90.3	2	3.8	3	5.7
April, 1924	54	39	72.2	4	7.4	11	20.3
May, 1924	65	57	87.6	2	3.0	6	9.2
June, 1924	78	69	88.4	5	6.4	4	5.1
Total	372	310	83.3	22	5.9	40	10.7

Chart 1.

GASTRIC ACIDITY IN THE SURGICAL DYSPEPSIAS

Clinical syndrome	Cases	Per cent Anacidity 0	Per cent Hypo-acidity 1-20	Per cent Normal 21-50	Per cent Hyper-acidity 50 Plus
Cholelithiasis	302	14.56	32.45	47.68	5.29
Common duct stone	228	21.92	28.5	46.05	3.5
Cholecystitis	306	11.76	28.43	51.63	8.16
Duodenal ulcer	306	0.0	6.86	60.78	32.35
Gastric ulcer	312	4.8	31.08	56.73	7.37
Gastric cancer	306	59.15	23.2	16.99	0.65
Malignant ulcers of stomach	169	24.26	21.3	44.37	10.05
Appendicitis	103	10.67	18.44	61.16	9.7

Chart 2.

SURGICAL DYSPEPSIAS — AGE INCIDENCE AND DURATION OF SYMPTOMS
(McVicar)

Lesion	Cases	Average age in years	Average duration of symptoms	Average weight loss in pounds
Gastric cancer	342	53.7	6.9 years	25
Gastric ulcer	264	44.9	9.8 years	23
Gastric syphilis	63	36.0	2.5 years	40
Duodenal ulcer	814	42.9	12.0 years	17
Cholecystitis	607	43.5	6.6 years	21
Chronic appendicitis	100	28.1	4.2 years	31 patients lost 12 pounds; 8 gained 15 pounds and in 32 there was no change.

Chart 3.

PEPTIC ULCER

Long history

Daily repetition of

Duodenal ulcer	Gastric ulcer
Food Comfort Distress	Food Comfort Pain Comfort

Relief by
- Food
- Alkalis
- Emptying stomach

Periodicity.

"Spells," often seasonal, periodic, alternate, with complete freedom.

Moynihan[3] in his concise way states, "if a breakfast is taken at 9 a.m. and the pain appears at 10 a.m. on one day, the same breakfast on all other days will be followed by the same hour of comfort and the same appearance of pain at the due moment, a time table of one day fits any other day." For a classical word picture of peptic ulcer we shall again quote Moynihan, who first pointed out the clinical syndrome of duodenal as distinguished from gastroduodenal ulcer. He says, "a patient will not seldom tell you that he can set his watch by the time incidents of his suffering. The periodicity of the pain is, of course, altered by variations in the quantity and quality of the food and by the irregularity of meals. A point which is well worth attention concerns the rhythm of the pain. In cases of gastric ulcer the pain, which after an interval follows the taking of a meal, gradually disappears before the next meal; in cases of duodenal ulcer the pain continues until the next meal, or until food is taken to give ease to a wearisome pain. The rhythm of gastric pain is 'food, comfort, pain, comfort'; of duodenal ulcer it is 'food, comfort, pain'; and then, again, 'food, comfort, pain,' a quadruple rhythm in gastric ulcer and a triple rhythm in duodenal disease. In my series of cases, pain appeared within two hours in three out of five of gastric ulcers, and after two hours in four cases out of five in duodenal ulcer." Seasonal variations are more common in duodenal than in cases of gastric ulcer.

The average duration of symptoms before consulting medical advice is, on an average, 12 years for duodenal ulcer, and about 9.8 years for gastric ulcer. In a review of 5,732 peptic ulcers, C. H. Mayo[4] found that 79 per cent were located in the duodenum. There is little to be gained by trying to differentiate from history alone between duodenal or gastric ulcer. This is admittedly a function of the roentgen laboratory. However, when one has established the accuracy of a peptic ulcer syndrome it is a four to one wager that the lesion is located in the duodenum.

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[3] Moynihan, Sir B.: Problems of Gastric and Duodenal Ulcer. Brit. M. J., 1:221-226, Feb. 10, 1923.

[4] Mayo, C. H.: Gastric and Duodenal Ulcers. Ann. Surg., 73:328-337, 1921.

The presence of night pain, relieved by the same methods employed to relieve the distress during the day, is also strongly indicative of peptic ulcer, especially if in addition to the usual methods of relief, the patient finds that midepigastric pressure tends to relieve his distress. Night pain is a sign of hypersecretion and a valuable danger signal indicating early retention.

Pain, radiating through to the back and synchronous in time of onset with the regular peptic ulcer syndrome, is strongly suggestive of a chronic perforation of the ulcer. This is pathognomic, if in addition to the back pain there is associated an almost continuous epigastric distress in place of the regular pain, food, comfort sequence. Nicolayson,[5] in a pathologic study of chronic gastric ulcers, found that over 90 per cent of his series of ulcers had perforated through the muscularis mucosa as a chronic perforation, with omentum or pancreas incorporated into the base of the ulcer. Duodenal ulcers of the posterior wall are also very prone to develop subacute or chronic perforation. A history of "acute indigestion" or "ptomaine poisoning" injected into a peptic ulcer history should arouse the suspicion of perforation.

Peptic ulcer complicated by obstruction, perforation, homorrhage or carcinomatous degeneration tends to lost type. The day by day sequence of pain, food, ease merges into a more or less continuous epigastric distress. Irrespective of the choice of treatment for uncomplicated peptic ulcer, the onset of evidence of any of the above mentioned complications and their sequelae demands surgical attention.

From a study of bleeding peptic ulcers experience teaches us that a duodenal ulcer which has bled before the first operation will again bleed with a recurring lesion in the duodenum. Likewise, if there was no bleeding from the duodenal ulcer before the operation, and hemorrhage is one of the recurring symptoms, the lesion is more likely to be gastrojejunal than duodenal.

The persistence of vomiting containing undigested food particles, in a patient whose history dates back from five to twenty years or more, usually means interference with gastric motility and obstruction.

Much has been written about carcinomatous degeneration of peptic ulcers. Duodenal ulcers have an incidence of carcinomatous degeneration of about 1:8000. The gastric ulcer incidence is of greater significance because of the ease with which a small penetrating primary ulcerating carcinoma may be confused with a chronic perforating benign gastric ulcer. Carcinomatous degeneration does occur, however, but at the most probably not in more than from 3 to 5 per cent of cases. The high figures often quoted arise from an overconcentrated study of the individual carcinoma cell rather than a study of the entire cross-section of every gastric and carcinomatous ulcer to determine the unmistakable signs of progressive pathologic change from benign chronicity to superimposed malignancy. This is an entirely different pathologic picture than is found in the primary small ulcerating carcinoma, simulating ulcer.

CARCINOMA OF THE STOMACH

- Appearance.
- Progressive decline.
  - Loss of vitality, weight, strength.
- Persistence of distress.
  - Usual remedies are ineffectual.
- Findings after a Riegel meal.
  - Altered blood.
  - Rancid food elements.

The present conception of cancer of the stomach is still that of its later stages. That gastric cancer has an early stage, during which it is curable, is often overlooked. It is true that this stage too frequently masks behind a clinical picture which may simulate any of the surgical dyspepsias. To better understand the early stages let us divide gastric cancer into two groups; the group in which the carcinoma grows into the gastric lumen, fungates and gives very few early symptoms because the gastric wall is not penetrated by the ulceration of the carcinoma. This group causes early symptoms only when the growth is near the pylorus. If the growth is in the midportion of the stomach, symptoms are, as a rule, not present until the size of the growth interferes with gastric motility, causing retention of food and vomiting. It is this group which often presents a painless palpable epigastric mass as the first sign of serious trouble, and is also responsible for the relatively short duration of symptoms commonly attributed to cancer of the stomach. The prognosis of this group is generally poor.

There is, however, a second group which gives symptoms at the very onset of trouble. As one would expect, this group ulcerates early and penetrates the wall of the stomach, producing irritation of the serous peritoneal covering of the stomach. This type of ulcerating cancer often mimics grossly the benign chronic peptic ulcer, and shows a high acid titer by test-meal, together with the roentgen picture of a penetrating crater lesion of the stomach. The patient during this early stage may present a well nourished appearance, show none of the cachetic appearance of the first group when symptoms are first discovered, and may even show temporary improvement with gain of weight on an ill-advised alkaline therapy and bland diet management.

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[5] Nicolaysen, K.: Pathologish-anatomische und experimentelle studien uber die Pathogenese des Chronishen Magengeschwurs. Deutsche Ztshr. f. Chir., 167:145-263, 1921.

A careful clinical investigation should be urged upon every patient over forty years of age who complains of the progressive persistence of symptoms of dyspepsia, of which he had not previously complained. Especially is this true if the symptoms of a long standing dyspepsia are of changing character, or the newly acquired dyspepsia is not responding to the usual remedies.

The weight loss found in carcinoma of the stomach is greater than in any other type of dyspepsia. After the malignancy is moderately advanced the epigastric distress persists in spite of the usual remedies, rest, bland foods, alkalies and lavage. Nothing gives complete ease, although vomiting relieves temporarily.

In the exact diagnosis of the organic lesion of the stomach and duodenum, after a careful history and physical examination have been done, the trained roentgenologist has proven himself of inestimable value. It is now possible to determine the exact location of organic lesions, and to determine to some extent the operability of malignant lesions. Metastatic foci in lungs and bones, detected by means of the roentgenogram have prevented numerous useless and meddlesome surgical procedures. By careful roentgen studies the progress of medical and surgical treatment of gastric lesions may be followed. Accurate differentiation of gastric and duodenal ulcers aids the surgeon in planning the proper technical approach when surgery becomes necessary.

Cholecystitis represents, perhaps, the outstanding example of what we term the reflex dyspepsia. The pathology lies essentially in the accessory digestive system but is closely associated with the pyloric mechanism through reciprocal ennervation and lymphatic drainage. It is a rather significant generalization that the patient with a peptic ulcer feels at his best on a full stomach containing bland foods, whereas the patient with a reflex type of dyspepsia, from chronic cholecystitis, pancreatitis or appendicitis, feels relieved on an empty stomach. The ingestion of food causes immediate distress, gas, belching and bloating, while the peptic ulcer patient obtains relief from his food.

CHOLECYSTITIS

- Gas.
  - Early after meal distension.
  - Belching and bloating.
- Food intolerance, qualitative.
  - Fats, sours, coarse vegetables.
- Intermission.
  - No periodicity.
- Transient liver tenderness.

CHOLELITHIASIS

- Symptoms of cholecystitis.
- History of colic.
  - Sudden onset and cessation.
  - Severity.
  - Location and reference of pain.

Mortality statistics have repeatedly pointed out that chronic cholecystitis leads to secondary changes in the liver and bile ducts. Early operation not only gives a more favorable surgical prognosis but also lowers the percentage of unrelieved cases following surgery. Hepatitis, secondary to a long neglected chronically infected gallbladder with or without stones, may cause a continuation of disabling and distressing symptoms long after the gallbladder has been removed. Common duct stones, pancreatitis, cholangitis and obstructive jaundice due to impacted common duct stones are often serious complications which increase mortality and morbidity percentages in a patient whose surgical risk at one time would have been small.

In a follow-up study of 634 instances of surgery of the biliary tract at the Lahey Clinic, Cattell[6] found that in cases where cholecystectomy was done for cholelithiasis a satisfactory result was obtained in 77.7 per cent of the patients operated upon. Less than 30 per cent of the patients in the series who have had a cholecystostomy performed were relieved for any long period of time. Those patients operated upon for cholelithiasis, complicated by extrabiliary operations, obtained satisfactory results in only 60.4 per cent of the cases, with a slightly higher operative mortality. The operative treatment for the noncalculous gallbladder was satisfactory only in those patients in whom conspicuous clinical symptoms were associated with definite pathology. In the uncomplicated cases of chronic cholecystits satisfactory end-results were obtained in 64.1 per cent of the patients operated upon, whereas in those instances of cholecystectomy complicated by extrabiliary operations only 59.1 per cent obtained satisfactory results.

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[6] Cattell, R. B.: End-results of Surgery of the Biliary Tract. Study of 634 Cases Treated at Lahey Clinic. Ann. Surg., 89:930-941, June, 1929.

The early removal of gallstones will very decidedly reduce the incidence of common duct stones and reduce the increased surgical mortality incident to operations upon the common duct with and without obstructive jaundice.

As a rule, the more clear-cut and characteristic the symptoms of cholecystitis and cholelithiasis are in the clinical history, the more likely is the patient to obtain satisfactory relief following cholecystectomy. One may also postulate that this is true, providing there is no associated pathology present and that the pathology found in the gallbladder is adequate to account for the clinical symptoms presented. A thin-walled, normal appearing gallbladder, removed for an indefinite syndrome mildly suggestive of cholecystic disease, can hardly be expected to offer the relief that may be expected from the removal of a chronic thick-walled gallbladder filled with stones, from a patient suffering from recurring attacks of gallstone colic. Failure to obtain relief after operation for chronic cholecystitis is usually due to an incomplete or wrong diagnosis.

An associated hepatitis may continue to give clinical symptoms for months after a chronically infected gall has been removed.

CHRONIC APPENDICITIS

Irregularity
  In character.
  In relief.
History of acute attacks.
Palpation.
  Local McBurney tenderness.
  Epigastric distress on pressure in McBurney's area.

The dyspepsia of chronic appendicitis is perhaps the most bizarre of all the surgical dyspepsias. There is no precise time of appearance of the various common symptoms, such a nausea, bloating, epigastric pain or heartburn. There is no typical mode of relief, and irregularity of symptomatology is the rule. The history of a previous acute attack of right lower quadrant pain with nausea and vomiting, followed by recurring attacks of deep-seated tenderness over McBurney's point and occasional nausea, forms the clinical picture frequently seen. The frequent association of chronic appendiceal inflammation with chronic cholecystitis and duodenal ulcer is also well known.

Sherren's[7] dictum, that "you may diagnose appendix dyspepsia: you should never act on that diagnosis," is wisely taken. However, the recent report of Rea Smith[8] on chronic appendicitis is significant. He reports that his best results in this all too unsatisfactory syndrome of the surgical dyspepsias is obtained if, in addition to appendectomy, he conducts a careful exploration of the entire cecum and ascending colon. The careful separation of all congenital and inflammatory tension bands which tend to interfere with a free peristaltic activity has in his hands reduced the percentage of unsatisfactory results in this group of surgical dyspepsias. My own experience, since adopting his dictum, has given me a much more satisfactory result than was obtained from merely removing the appendix alone and leaving obvious tension bands constricting the cecum.

A carefully taken clinical history followed by the necessary laboratory data will in most instances eliminate the large group of nonsurgical dyspepsias, i.e., the functional dyspepsias, migraine and the reflex dyspepsias due to spastic colon, constipation and gastroptosis. Some of the conditions may seem to mimic a surgical dyspepsia upon a cursory examination, but a careful investigation will in most instances give a correct diagnostic evaluation.

SUMMARY

1. A careful history analysis is a valuable adjunct to the diagnosis of the surgical dyspepsias.

2. The various syndromes each have characteristic differences which aid in an accurate diagnosis with judicial use of the laboratory aids and the roentgen examination.

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[7] Sherren, J.: Lectures on the Surgery of the Stomach and Duodenum. London, Lewis & Co., p. 96, 1921.

[8] Smith, Rea: Chronic Appendicitis. Ann. Surg., 88: 678-684, 1928.

Bleeding of Benign Origin. Leo Kessel, New York (*Journal A. M. A.*, Oct. 10, 1931), states that patients who present the ominous symptoms of hemorrhage may occasionally suffer from a benign lesion, and the disease may run a propitious course. The diagnosis of benign bleeding, however, must never be hazarded until all available examinations have excluded the presence of a blood dyscrasia, malignant neoplasm or chronic inflammatory process, such as tuberculosis. It is unwise, furthermore, to advance this diagnosis unless the benign lesion can be visualized by some direct method of examination, such as bronchoscopy or proctoscopy. Indeed, even in cases in which a malignant process has been excluded and a benign process demonstrated, the cautious diagnostician will proceed with the knowledge that the patient with a benign cause for bleeding may harbor a malignant disease as well.

SARCOMA OF THE ALIMENTARY TRACT

A PATHOLOGIC AND STATISTICAL STUDY *

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Sarcoma of the alimentary tract is fairly rare, and literature on the subject presents many confusing pictures in which clinical data and microscopic details are rather obscure. Generally speaking, the diagnosis before operation or necropsy is seldom made, and the treatment remains more or less empirical. This paper embraces a series of seventy-two consecutive cases of sarcoma of the alimentary tract, from the esophagus to the rectum inclusive, which I have studied and have attempted to analyze from a pathologic and statistical standpoint. In doing so I have tried to present a more orderly picture of the condition, so that there may possibly be a better understanding of this rapidly growing and extremely fatal process.

Scarcely any two pathologists so far have agreed on the cellular origin of sarcomas in general. Mallory,[1] who has given his recognition to the theory that there are fifteen distinct and original body cells, has held that any tumor, regardless of its nature, arises from one of these original fifteen varieties of cells. Hence it follows that fibroblastoma, or fibrosarcoma, arises from the embryonic or primary fibroblast; lymphoblastoma, or lymphosarcoma, from the primary lymphoblast, and so forth. Ewing,[2] on the other hand, has drawn a distinction between the types of lymphosarcoma. He has expressed the belief that there are two types of lymphosarcoma; namely, those derived from the reticulum cell, which he has classified as large round-cell sarcoma, and malignant lymphocytomas or lymphosarcomas, which arise from the primary lymphocyte or lymphoblast. However, the fact remains that these malignant tumors are composed of embryonic tissue, and until a definite relationship is established between the reticulum cell and the lymphocyte they may be considered to be one histologic entity; namely, lymphoblastoma or lymphosarcoma. Ewing also has expressed the belief that the true round cell of fibroblastic origin does not occur; in other words, the round cell sarcoma does not spring from fixed connective tissue, and it must be either a lymphosarcoma or a small celled carcinoma.

Review of this series of cases seems to give foundation for the opinion that fibrosarcoma, spindle cell sarcoma and true round cell sarcoma have one common origin, namely, the primary and undifferentiated fibroblast. Likewise, or at least until there is more definite proof to the contrary, one may consider lymphosarcoma, Hodgkin's disease, malignant leukoma and the lymphogranulomatosis of the Germans as merely different clinical manifestations of the same or of a very closely related pathologic process, the origin of which is the primary lymphoblast found in the germinal centers of lymph nodes. Twort[3] has recently completed a six years' study of sixty-one cases of Hodgkin's disease, and has concluded "there appears to be no single feature which permits one to diagnose lymphadenoma (Hodgkin's disease) with certainty." In my study of cases I paid particular attention to this one point, and could observe no phenomena that would permit of a diagnosis without a certain amount of clinical data.

Regarding the so-called perithelioma, or perithelial angiosarcoma, MacCallum[4] has said he thinks it unlikely that any such tumor exists, since the cells of this tumor bear no resemblance to endothelial cells but there is a bare possibility that they may arise from the walls of the vasa vasorum or from the lymphatic structures in the walls of the blood vessels. There is one such tumor in this series, and in the microscopic sections of the growth I could find no evidence of the so-called perithelial cells, but instead, simply necrosis of the tumor tissue everywhere except around the abundant blood vessels, which might lead one to think this region to be the origin of growth.

The seventy-two cases which form the basis of this study do not include cases of sarcoma of the oral cavity, nor do they include retroperitoneal growths which were attached to some portion of the stomach or intestine. In these cases, at operation or at necropsy, tumors were found either growing from the wall of a viscus outward, and spreading beneath the peritoneal coat, or growing inward, involving and destroying the mucosa. In no case in this series did I find evidence of early erosion of the mucous membrane, as would be shown clinically by hemorrhages or occult blood in the stool. Carcinoma, on

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* Work done in the Section on Surgical Pathology, The Mayo Clinic, while a Fellow in Surgery, The Mayo Foundation, Rochester, Minn.

* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., Aug. 3-5, 1931.

1. Mallory, F. B.: The Principles of Pathologic Histology. Philadelphia, W. B. Saunders Company, 1914, 677 pp.

2. Ewing, James: Neoplastic Diseases. Ed. 3, Philadelphia, W. B. Saunders Company, 1928, 1127 pp.

3. Twort, C. C.: The Etiology of Lymphadenoma: A Summary of Six Years, Researches. Jour. Path. and Bacteriol., 33:539-546, July, 1930.

4. MacCallum, W. G: A Text-book of Pathology. Ed. 3, Philadelphia, W. B. Saunders Company, 1924, 1162 pp.

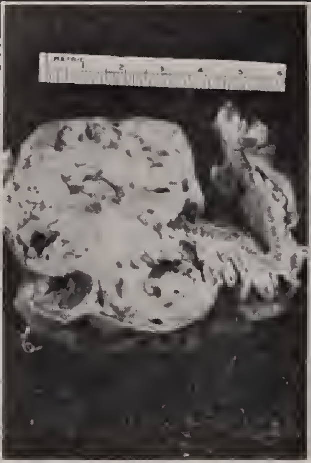

Fig. 1

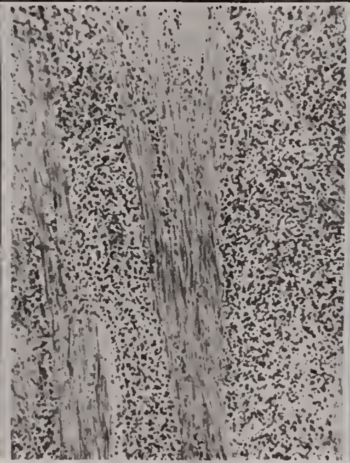

Fig. 2

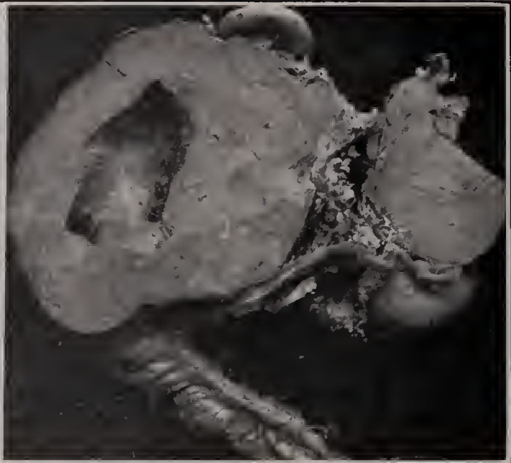

Fig. 3

Fig. 1. Lymphosarcoma of the small bowel. Complete destruction of the muscular coat, intact mucosa and numerous hemorrhages into the tumor.

Fig. 2. Lymphosarcoma (x125) demonstrating the destruction of muscle bundles by the invading growth.

Fig. 3. Lymphosarcoma of the cecum in a boy six years of age who is living and well nineteen years after resection. Note the large metastatic nodule in the mesentery.

the other hand, frequently presents both of these phenomena, because the epithelial coat is the primary site of the growth. Carcinoma, involving the epithelium of the stomach or intestine, causes erosion, early bleeding and stenosis due either to the size of the growth or to contraction of fibrous tissue. Sarcoma, in my series, seemed to cause obstruction by pressure from without or, as in two cases, by intussusception. Furthermore, I have observed that sarcomas, especially lymphosarcomas, are prone to spread through the muscular coat of the bowel, thus destroying the muscle, which results in distinct pouching or dilatation above the growth.

Lymphosarcoma (figs. 1, 2 and 3), of which there are fifty examples in this series of cases, must necessarily have its origin in some lymphatic structure. Nothnagel[5] has given the opinion that the growth originates in the solitary nodules of the mesentery and spreads to the submucous layer of the intestine by way of the lymphatic structures. He pointed out that many observers believe Hodgkin's disease of the abdomen to be identical in behavior to that just outlined, in that it arises primarily in the solitary lymph nodes of the mesentery or in the retroperitoneal nodes, and spreads later by the lymphatic channels to the bowel. However, as far as my series is concerned, in thirteen of the fifty specimens of lymphosarcoma I found absolutely no evidence of involvement of the mesenteric nodes; nor had it been possible to palpate the retroperitoneal nodes at operation. Therefore, I believe that these tumors had their origin in the wall of the viscus itself. This point alone would seem to prove a distinct difference in origin between this process and Hodgkin's disease. As lymphosarcoma grows, it spreads along the submucous lymphatic channels, destroying the muscular coats, leaving the wall thinnned out and nonelastic. It attacks the epithelial coat late or not at all, and rarely, if ever, invades the serosa. These two points I found to hold constant in examination of the specimens in this series (figs. 1 and 2). In figure 2 is observed the breaking down of a muscle bundle by the invading sarcomatous cells, and the thinning out of the bundles until the muscular coat is entirely destroyed.

Grossly, these tumors are firm, irregular in contour, nonencapsulated, and the cut surface has a distinctly granular appearance. Examination of the wall of the viscus through which this growth has spread reveals a stiff, nonelastic condition which has been aptly described by some pathologists as having the feel of a piece of garden hose. In this series, some of the growths, which were apparently of long standing both clinically and pathologically, had become ulcerated into the viscus, thus presenting varying degrees of formation of cavities and sinuses which were seen to be discharging broken down sarcomatous material into the lumen of the viscus. Patients who have these tumors may give histories of gross bleeding from the bowel or of vomiting of blood. This, of course, is due to erosion of good sized vessels by the encroachment of the growth. Metastasis in some cases is early; figure 3

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[5] Nothnagel, Hermann: Diseases of Intestines and Peritoneum. Philadelphia, W. B. Saunders Company, 1905, 1032 pp.

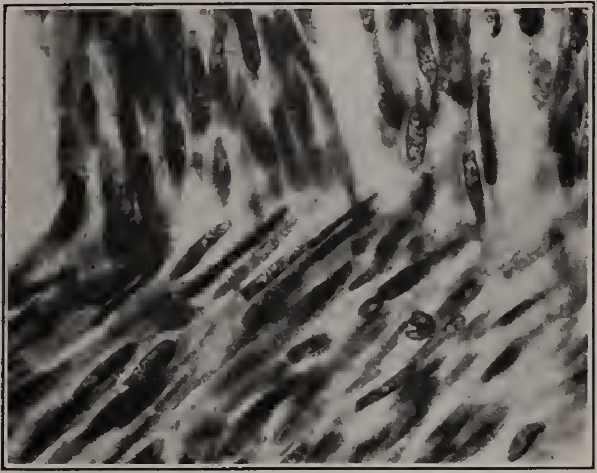

Fig. 4. Spindle cell sarcoma of the stomach. Note the tail fibril.

shows this to be true in a case of lymphosarcoma of the cecum. A photograph of this specimen shows the large metastatic nodule in the mesentery. In Hodgkin's disease, although the tumor presents the same microscopic appearance, it does not arise in the wall of the bowel but in the mesenteric or retroperitoneal nodes; the intestinal wall always remains intact.

Microscopic examination in these fifty cases of lymphosarcoma showed the tumor to be composed almost entirely of undifferentiated lymphocytes, or of lymphoblasts identical to the cell that is found in the germinal centers of lymph nodes or in agminated follicles. The cells, as a rule, are evenly distributed and closely packed together; there is very little stroma, and when viewed with high power, the cells are slightly larger than the normal lymphocyte, contain a single faintly staining nucleus, a deeply staining nucleolus and numerous, deeply basic staining granules scattered unevenly throughout the protoplasm. There are also numerous normal lymphocytes scattered throughout the tumor. The conception seems to be that lymphosarcoma, as well as sarcoma in general, is extremely vascular, but I found relatively few blood vessels coursing through the tumor proper. Certainly there are numerous small vessels, and even an occasional tortuous sinus lined with a very thin layer of endothelial cells or not at all, but in this series, at least, I found the tumors to be rather avascular. There were, however, scattered regions of necrosis often containing partially disintegrated erythrocytes and granular debris, due, no doubt, to numerous hemorrhages into the tumor which occurred as it encroached on the neighboring blood vessels.

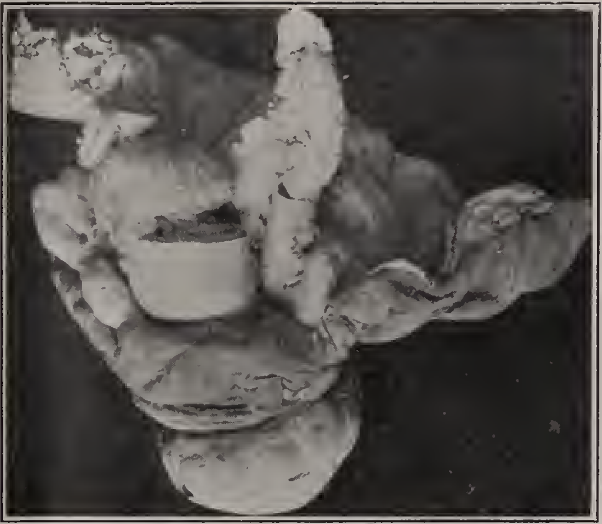

Fig. 5. Complete acute obstruction due to invagination of the bowel in the presence of round cell sarcoma.

Spindle cell sarcoma (fig. 4), of which there were three in this series, as far as is now known, originates in the connective tissue of the submucosa or in the muscle of the viscus, and appears to follow no particular plane. The three cases herein referred to appeared to metastasize early, and secondary growths were found in the lungs either at necropsy or by roentgenologic examination. It would thus appear that metastasis was by way of the blood stream. The cells of this type of growth are shaped like oat grains and many of them carry fibrils on either end. The cells run in strands, closely packed together, and the strangs, or bundles, are separated by only a small amount of homogeneous substance. I found this substance, in certain portions, to be taking on the characteristics of fibrous tissue; at least numerous fibroblasts could be identified. Probably this was an attempt on nature's part to wall off the growth. One interesting thing about the microscopic appearance of this type of growth is the fact that the diagnosis may be mistaken at times, if the section in question is cut through the tumor at a point which is at right angles to the direction in which the cells are running. In this case the cells are cut crosswise, and closely resemble those of a round cell type of sarcoma (fig. 4).

Ewing has expressed the thought that the round-cell sarcoma (fig. 5), as such, does not exist but that it is probably a small-celled carcinoma. However, other authorities seem to be agreed on the point that this type of growth is of fibroblastic origin. There were six of these sarcomas in this series, and five of them were pedunculated; one of the pedunculated variety caused complete obstruction due to invagination of the bowel (fig. 5). There is nothing outstanding in the gross appearance of this type of growth to distinguish it from lymphosarcoma. Microscopic examination reveals a type of cell closely resembling the lymphoblast in general appearance. The round cell, however, somewhat larger than the lymphoblast, is slightly ovoid, and contains a single, deeply basic staining nucleus centrally located. Like the lymphosarcoma, the growth contains few blood vessels and little intracellular material. In these cases the most frequent site of metastasis was the lungs, and judging from all the data I could collect, metastasis took place early in the course of the disease. Round cell sarcoma, especially if extremely malignant, is very frequently confused with lymphosarcoma.

In comparison with carcinoma of the alimentary tract, sarcoma is extremely rare. In the period of twenty years covered by this study, 1,922 cases of sarcoma of all parts of the body were treated at The Mayo Clinic, and in 106 of these the growth was attached to, or involved, some part of the alimentary canal, from the mouth to the anus inclusive. During this same period, 5,040 cases of carcinoma of the alimentary canal were treated; thus, sarcoma constituted 1.42 per cent of all malignant growths of the alimentary canal proper. Nothnagel, in referring to the rarity of the condition, wrote that among 2,125 postmortem examinations for carcinoma performed at the Vienna General Hospital, 245 of the growths were of the intestine, whereas of 274 cases of sarcoma only three were of the intestine. Table 1 demonstrates the distribution of the cases studied in my series as well as some related data. The occurrence, in order of histologic structure, was as follows: lymphosarcoma, fifty cases; round cell sarcoma, six; fibrosarcoma, four; myosarcoma, four; spindle cell sarcoma, three; angiosarcoma, two; mixed cell sarcoma, one case; giant cell sarcoma, one, and sarcoma myoides, one.

Moynihan,[6] in 1925, published his series of cases and tabulated them as follows: round cell sarcoma, eighteen cases; spindle cell sarcoma, seven; lymphosarcoma, three; alveolar sarcoma, two; fibrosarcoma, one case, and myxosarcoma, one. It will be noted, in Moynihan's series, that the round cell variety of sarcoma predominated; whether or not some pathologists would have considered these growths to be lymphosarcomas is a possible question. The distribution of the growths in this series is given in table 2.

Comparison between incidence of carcinoma and sarcoma of the alimentary tract at The Mayo Clinic in a period of twenty years.

Organ	Carcinoma (including the mouth), number	Sarcoma (excluding mouth) Number	Percentage of 5,040	Percentage of 72
Stomach	1,984	37	1.9	51.2
Cecum	248	7	3.2	9.8
Ileum	0	8	100	11.1
Rectum	1,821	6	0.32	8.3
Cecum and ascending colon	0	4	100	5.5
Jejunum	0	3	100	4.1
Sigmoid	430	3	0.69	4.1
Colon only	327	2	0.62	2.7
Ileum and jejunum	10	1	10	1.38
Appendix	90	None primary	90	
Duodenum	9	None primary	9	
Esophagus	121	1	0.8	1.38
Total	5,040	72		

TABLE 1

Distribution of sarcoma according to histologic structure and situation*

Type	Stomach	Ileum	Cecum	Rectum	Cecum and ascending colon	Jejunum	Sigmoid	Ileum and colon	Jejunum	Esophagus	Total
Lymphosarcoma	27	5	5	2	4	2	1	2	1	1	50
Round cell sarcoma	1	1	1	3							6
Fibrosarcoma	3		1								4
Myosarcoma	2	1		1							4
Spindle cell sarcoma	1	1				1					3
Angiosarcoma	2										2
Giant cell sarcoma							1				1
Mixed cell sarcoma	1										1
Sarcoma myoides							1				1
Total	37	8	7	6	4	3	3	2	1	1	72

TABLE 2

*Rivers has since reported a case of fibrosarcoma of the jejunum; there are only four other cases on record.

Broders and Mahle[7] reported one case of sarcoma of the stomach to sixty-eight of carcinoma. Staemmler[8] of the Chemnitz Pathological Institute reviewed 394 cases of sarcoma of the intestine and found that the majority of the growths were in the rectum; his observations seem to show that at necropsy one case of sarcoma is found to every sixteen cases of carcinoma (institutional practice), whereas in private surgical practice there is one case of sarcoma to every 100 cases of carcinoma. Libman[9] claimed that among forty-two cases of sarcoma of the small bowel he found the duodenum affected as often as the ileum, but search of the literature and review of my cases does not disclose this proportion generally.

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[6] Moynihan, Berkeley: Abdominal Operations. Ed. 3, Philadelphia, W. B. Saunders Company, 1915, 488 pp.

[7] Broders, A. C. and Mahle, A. E.: Primary Lymphosarcoma of the Stomach. Jour. Lab. and Clin. Med. 6:249-252 (Feb.) 1931.

[8] Staemmler: Quoted by Loria, F. L.: Primary Sarcoma of the Intestines. New Orleans Med. and Surg. Jour., 78:201-208, Oct., 1925.

[9] Libman: Quoted by Miller, C. J.: Acute Invagination of the Ileum Secondary to Sarcoma of the Small Intestine. S. G. and O., 17:210-213, Aug., 1913.

Regarding the distribution between the sexes, forty-six of the patients in my series were males and twenty-five females. This ratio does not hold true of carcinoma. The youngest patient was six years of age, and the oldest seventy-two years; the average age of the patients was forty-four and sixty-two hundredths years and the decade of life of greatest incidence was the fifth year. Jopson and White[10] have pointed out that the number of males and of females with sarcoma of the large bowel was about equal in their series of cases, but among patients with sarcoma in other portions of the alimentary tract the ratio was two males to one female. In my series of seventy-two cases, fourteen males and eight females had sarcoma in the large bowel, and twenty-three males and eight females had sarcoma of the stomach.

With the advent of industrial medicine and the increasing frequency of lawsuits for real or alleged malpractice, it must always be kept in mind that a sarcoma may develop at the site of an injury. Ewing has analyzed a number of cases wherein the growth which appeared at the site of trauma was proved to have been secondary to a primary growth situated elsewhere in the body, and he has expressed the belief that metastasis was precipitated at this region due to lessened resistance of the tissues. In my series I have found a definite history of trauma in four cases, and a history of chronic irritation, such as excessive use of tobacco and alcohol, or a perverted appetite for a hard, indigestible substance in twelve cases. Probably the outstanding case of this series illustrative of the part played by trauma is that of a boy six years of age, who was kicked in the abdomen by a horse; two weeks later a tumor developed in the right lower abdominal quadrant, and at operation proved to be a highly malignant lymphosarcoma of the cecum. The patient was perfectly healthy nineteen years following operation. Pistocchi[11] found a lymphosarcoma at necropsy following a severe contusion of the epigastrium five months previously. Farr[12] has expressed the belief that sarcoma is less common than carcinoma, due to the origin of the former from connective tissue which is not exposed to chemical and mechanical insult. Fisher's[13] patient, who had sarcoma of the ileum, was addicted to eating white sand.

There are a few symptoms of sarcoma of the alimentary tract which differ from those of carcinoma. One of the most marked is rapid loss of from ten to eighty pounds in periods of from three weeks to thirty-six months. The average loss of weight for this group was twenty-seven pounds, and the average time in which this weight was lost was six and four-tenths months. Marked hemorrhage was present in only eight cases, and among the thirty-seven cases of sarcoma of the stomach blood was found by analysis of gastric content in only ten, thus demonstrating the infrequency of ulceration of the mucosa. Twelve of the cases presented the syndrome of ulcer, and vomiting without relief was a constant feature; in eight cases there was hyperacidity; in twenty cases, the values for gastric acids were low, whereas in nine these values were practically normal. In the presence of sarcoma of the small bowel, the most prominent complaint was pain which was invariably present at the site of the tumor. A mass was found on examination in eighteen of the twenty-one cases. In Perez'[14] case this mass grew to the size of a grapefruit in one month; this may be explained by the fact that multiple hemorrhages often take place in the tumor. Rankin[15] wrote that the one most consistent feature of sarcoma of the small bowel is intermittent obstruction, due to dilatation above and about the growth. In two cases of my series complete obstruction, due to invagination of the bowel, took place.

The differential diagnosis rests among carcinoma, lymphatic leukemia, hyperplastic tuberculosis, benign tumor, Hodgkin's disease, diverticulitis or any condition which may cause chronic intermittent obstruction, rapid loss of weight and anemia.

The prognosis is invariably grave. In this series the operative mortality was 16.66 per cent; in Moynihan's series of thirty-two cases, it was 37.5 per cent. Of my series of seventy-two patients, sixty-five could be traced. Of the two patients who were less than ten years of age when operation was performed, one is living and well nineteen years after operation; the other cannot be traced. Sixteen patients are alive and well, and 31 per cent of the entire seventy-two patients in the series were operated on five to ten years ago. However, I have found in reviewing the mortality statistics of this series that the chances of prolonging life are better as the age of the patient increases.

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[10] Jopson, J. H. and White, C. Y.: Sarcoma of the Large Intestine. Am. Jour. Med. Sc. 22:807-828, Dec., 1901.

[11] Pistocchi, Guiseppe: Sarcoma primitive dello stomace e traumi. Genesi traumatica di tumori. Policlinico, 30:83-112, Feb. 15, 1923.

[12] Farr, C. E.: Sarcoma of the Stomach. Arch. Surg., 13:75-80, July, 1926.

[13] Fisher, E. M.: Intestinal Sarcoma. Med. Jour. Australia, 1:337-339, April 4, 1925.

[14] Perez, G: Sarcoma Primitive Intestina Piccina. Arch. Ital. d. chir., 3:181, March, 1920.

[15] Rankin, F. W.: Lymphosarcoma of the small intestines. Ann. Surg., 80:704-711, Nov., 1924.

SUMMARY

Of seventy-two patients who had sarcoma of the alimentary canal, sixty-five have been definitely traced. Of these, forty-nine are dead and sixteen are living and well. The stomach was involved in thirty-seven cases, more than any other organ. There were no cases of primary sarcoma of the appendix. Fifty of the growths were lymphosarcomas; this is the predominant type of sarcoma in all portions of the alimentary tract, with the exception of the rectum. The fifth decade of life was the decade of the greatest incidence. The most prominent symptom of sarcoma of the small bowel was pain at the site of the growth, accompanied by intermittent attacks of partial obstruction.

COMEDO ADENOCARCINOMA OF THE BREAST

WITH REPORT OF A CASE IN A GIRL NINETEEN YEARS OF AGE*

Frederick C. Hill, M.D.
OMAHA, NEB.

Comedo adenocarcinoma of the breast is an uncommon condition and its occurrence in a girl nineteen years of age would seem to make the case worthy of record.

Bloodgood,[1] in 1893, was the first to describe this tumor and named it for the most characterstic feature in its gross appearance. When a comedo adenocarcinoma is sectioned the surface is seen to be studded with numerous minute, yellowish points which are ducts filled with necrotic material. Pressure on the tumor causes this caseous detritus to be expressed in a worm-like form. The tumor itself is soft and friable in consistency, and is very diffuse, involving a quadrant or more of the breast. In advanced cases there may be ulceration of the skin or more rarely retraction of the nipple.

Comedo adenocarcinoma of the breast may be classified with the adenocarcinomata. This group includes those tumors which show arrangement of their cells into tube-like structures, giving them a glandular appearance. Metastatic growths from this type of cancer retain the same glandular character. The term adenocarcinoma as used here has no reference to the source of origin of the cancer, but is employed to distinguish it from scirrhus, medullary and colloid types.

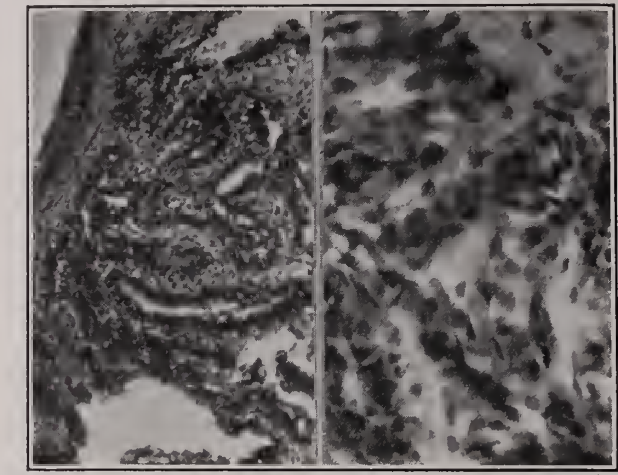
Fig. 1. Fig. 2.

Fig. 1. Low power photomicrograph, showing small cyst and papillary outgrowth with duct formation.

Fig. 2. High power photomicrograph, showing epithelial hyperplasia in the walls of the ducts.

Comedo adenocarcinoma apparently begins in the ducts, where there occurs a hyperplasia of the lining epithelium. The process extends along the duct, and gradually breaks through the connective tissue of its wall into the surrounding stroma, where new tube-like structures may be formed. Under the microscope the ducts appear to be distended, lined with several layers of chromophilic cells, and are more or less filled with necrotic tissue and broken off malignant cells. The tendency of the tumor to extend along the ducts doubtless explains its diffuse character and the absence of any sharply delimited margin.

That comedo adenocarcinoma is a tumor of considerable rarity is shown by the fact that Bloodgood, from the time of his original description of the tumor up to 1917, had collected records of only twenty-three cases. Deaver and McFarland,[2] in a study of 575 cancers of the breast, found thirty-five which they classified as adenocarcinoma, but they did not subdivide these so as to give the number of comedo adenocarcinomata in the group.

There have been enough cases of carcinoma of the breast reported in young girls to make it common knowledge that it may occur, but such cases are few and far between. Harrington,[3] in reviewing

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* Read before the meeting of Eastern Oregon District Medical Society, Wallowa Lake, Ore., August 1, 1931.

[1] Bloodgood, J. C.: Lesions of the Female Breast. Binnie's Treatise on Regional Surgery. Vol. 1, Sec. 23, pp. 611-12. P. Blakiston's Son and Co., Philadelphia, 1917.

[2] Deaver, J. B. and McFarland, Joseph: The Breast, Its Anomalies, Its Diseases and Their Treatment., p. 485. P. Blakiston's Son and Co., Philadelphia, 1917.

[3] Harrington, S. W.: Carcinoma of the Breast. Surgical Treatment and Results. J. A. M. A. 92:208-213, Jan. 19, 1929.

2083 histories of carcinoma of the breast in patients treated at the Mayo clinic, found only one in a girl under twenty, and only three others in women below the age of twenty-five.

CASE REPORT

The patient, a girl of 19 years of age, and a university student, came to the office December 20, 1930, stating that she felt a lump in her right breast. Five days previously she had noticed a small brownish spot on the skin of the breast just above the areola. Her attention thus directed to the breast, she had then discovered a lump deep in the breast tissue in that region. She had had some pain in the breast that night following the palpation but none since, and the lump had not changed in size. During the previous three months she had lost about ten pounds in weight. Her past history was otherwise irrelevant.

Her physical examination was negative with the exception of the right breast. In this organ, just above the areola but rather deeply placed in the breast tissue, there was felt a moderately firm mass about 2 cm. in diameter. It was rather indefinite in outline, not tender and not attached to the skin or to the chest wall. There was no sign of the brownish area which she had first noticed. From the above findings, it was suspected that the mass felt was either a fibroadenoma or an area of mastitis, but in view of the impossibility of ruling out malignancy, operation was advised.

The tumor was widely excised and was found to be indefinitely outlined, involving a large part of the upper quadrant of the breast. It was yellowish in color, soft in consistency, and on a cut surface the minute grayish points typical of comedo adenocarcinoma could be seen. Necrotic material could be expressed at these points by pressure. Sections of the tumor are shown in the accompanying photomicrographs.

New gland-like formations will be noted, and the ducts show thickening of their walls with several layers of cells. The nuclei of the cells stain deeply and many are round, showing a tendency to return to the undifferentiated cell type. The interior of some of the ducts is packed with cells apparently broken loose from the walls. Many small cysts were also seen, due possibly to the stoppage of the ducts by these cells and other detritus.

A radical amputation was performed and later the breast and other tissue was sent to Dr. A. C. Broders, who was kind enough to study it. He classified is as a grade I malignancy. No glandular involvement was found. Since the operation the patient has gained back her weight and strength, and has excellent function in her arm.

CONCLUSIONS

Comedo adenocarcinoma is usually of low grade malignancy and rarely metastasizes to the axillary glands. Bloodgood reported that none of his 23 cases had died of cancer, and in none of them did he find any involvement of the axillary glands. For this patient, with a grade I tumor and its radical removal, the prognosis should be excellent. This case should offer us encouragement in our education of the laity in the early signs of cancer. In spite of her youth and her natural reluctance to complain of such a condition, this patient knew that any lump in the breast should be viewed with suspicion, and at once sought medical advice.

THE FIELD OF THORACIC SURGERY*

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This talk is presented with some apologies, because the extent of the subject allows only a rambling discussion of the field in general. However, it may not be out of place to bring to your attention the possibilities in that branch of surgery which was the last to be developed, and in which great progress is being made; also to call attention to some of the advances which have been made in the last few years, and in addition to bring out here and there a few points which may be helpful in the earlier and better diagnosis of some conditions and their more successful treatment.

Diagnosis in general is now more accurate and more satisfactory than ever before. Besides a careful history and physical examination, a good deal can be learned from the laboratory. In addition to routine work, bacteriologic studies are often of the highest importance, especially in empyema and pulmonary suppuration, including lung abscess. A great deal of work has been done on this subject. The roentgen-ray is, of course, of tremendous value, and besides plain and stereoscopic plates, surprising things are often found in lateral pictures and those taken at an oblique angle. Also since the advent of lipiodol, we have as satisfactory a means of outlining the interior of the lung as is the barium meal in outlining the interior of the stomach.

The bronchoscope and esophagoscope are often indispensable, and they furnish reliable information not obtainable by any other means. In certain cases, free from adhesions, the thoracoscope introduced in the pleural cavity will reveal the picture, and lastly there is the exploratory thoracotomy which can be done with little more risk than an exploratory laparotomy, and with proper preparations and precautions almost as simply. It is remarkable, when one considers that we have at our disposal more means of investigating the thorax and its contents than we have of making a diagnosis in the abdomen, that the thorax was, until comparatively recently, a relatively unknown field.

In the matter of treatment great progress has been and continues to be made. Much of this has developed in the last decade. Knowledge of the pathology and pathologic physiology of the thoracic contents has increased tremendously, and has had its application in better diagnosis and more intelligent treatment. Simpler and more feasible ways have been found of accomplishing results. It is no longer necessary to have a negative pressure chamber to safely open the thorax. Positive intrapharyngeal pressure from a gas machine has been found to be effective and sufficient.

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* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., Aug. 3-5, 1931.

Virtually the whole development of the surgical treatment of pulmonary tuberculosis has taken place within this period. Safer and more effective ways have been found of dealing with such devastating conditions as bronchiectasis. Partial and massive atelectases have been recognized and studied and, together with subsequent pneumonia, have been found to be largely preventable by inhalations of carbon-dioxide and oxygen, not only after thoracic operations but other surgery as well. Cardiac surgery is coming more out of the experimental stage and is being put on a stable basis. Better ways are being constantly brought forward for dealing with tumors of the esophagus, and also of the mediastinum and lungs. As more accurate and earlier diagnoses are made, so will the possibilities for more radical treatment and permanent cures develop. We shall now briefly consider, more specifically, some of the lesions of the thoracic wall and its contents, with here and there remarks on diagnosis or treatment.

INJURY

Under modern conditions injuries of the chest as a whole are fairly common, and range from a few broken ribs to severe mutilating and crushing accidents, involving almost the entire thorax and its contents. Open or valvular types of pneumothorax may be present, or a tremendous subcutaneous emphysema covering the whole body. It is best to assume a policy of minimal interference. If a large open pneumothorax is present, it is imperative that the hole be closed, even if only with a thick dressing.

If it be a valvular pneumothorax with increasing tension and dyspnea, it will be necessary to relieve the pressure either by repeated aspirations, or by a closed drainage which will allow the air to escape.

If there is present a bleeding wound of the chest wall, it is necessary to decide whether the blood is coming from an intercostal artery or from intrathoracic viscera, and to determine the advisability of active interference. As a rule this is usually not wise. Such wounds may be closed loosely and the patient placed on the injured side, with the wound at the most dependent point. The bleeding will usually stop, and the hemothorax gradually leak out on the dressings. If a large hemothorax is present in a relatively closed chest, it is better to delay aspiration of the blood for a time, lest this cause the bleeding to again become active. Absolute quiet and measures directed toward combating shock and hemorrhage will in general produce the best results.

CHEST WALL

In addition to injuries, the chest wall may be the site of abscesses either simple or tuberculous, which may arise superficially, or be the result of empyema which has perforated. Sinuses may be present extending only to the rib, or into the pleural cavity from an empyema which has opened itself. Osteomylitis of the ribs may be pyogenic or tuberculous. Tumors may spring from soft tissue or from the bone, and are benign as chondromata or malignant as sarcomata. Because of their accessibility these lesions of the chest wall should be recognized early, and the treatment should be successful in all except the most malignant tumors.

DIAPHRAGM

The diaphragm is involved directly or indirectly in several conditions. Diaphragmatic hernia is not so uncommon as one might suppose, and by bearing it in mind, a much earlier recognition should be possible. It may be congenital or acquired from a crushing or cutting injury. Any case having obscure dyspnea or digestive disturbances should have a roentgenogram of the chest, in order to rule out this possibility. The treatment is eminently successful and greatly aided by phrenicectomy or, at times, a mobilization of the chest wall to relax the diaphragm, and permit the closing of large defects. Occasionally almost unbelievable amounts of abdominal viscera have passed through the diaphragm into the thorax.

Subphrenic abscesses are often most accessible for drainage through the chest wall and pleural cavity, and when possible their evacuation in this manner avoids infecting the peritoneum and possible severe peritonitis. Before this is done adhesions should be produced if not already present between the pleural surfaces, to avoid infecting the entire pleural cavity. Persistent and intractable hiccough may be stopped by the freezing of one or both phrenic nerves, which is a simple procedure, and allows regeneration of the nerve in a few months. Lacerations of the diaphragm should be repaired as soon as the patient's condition justifies.

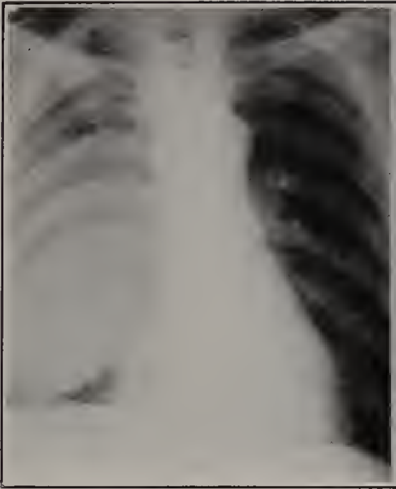

Fig. 1

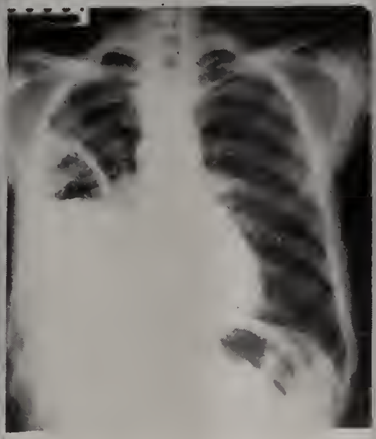

Fig. 2

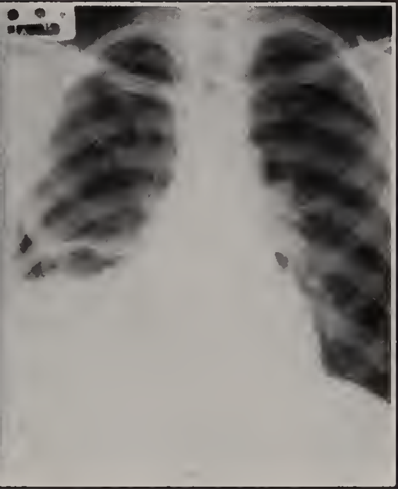

Fig. 3

Fig. 1 Acute sacculated empyema.
Fig. 2 Huge lung abscess with fluid level.

Fig. 3 Extensive pulmonary suppuration with multiple abscesses.

PLEURA

The pleura is subject to several conditions requiring surgery. An effusion which is perfectly clear may be tuberculous or nontuberculous, often the former. In either case only enough should be aspirated to relieve the patient of any immediate respiratory distress. In acute empyema one should delay drainage until it is certain that the pneumonia has subsided, and until the pus has become somewhat thick (fig. 1). Sudden emptying of a large collection of pus should be avoided. If the pus is thick, as that produced by the pneumococcus, rib resection and open drainage may be used; but where the pus is thin and the bacteriologic examination shows streptococci and other bacteria, closed drainage through a catheter and tube under water is imperative to avoid mortality and morbidity. In infants up to the age of one and a half to two years, repeated aspirations will produce the best results, because of the high operative mortality, especially under the age of one year.

Tuberculous empyema which has not become secondarily infected should never be drained, but treated by repeated aspirations and later by thoracoplasties. We have had patients in whom external drainage of a tuberculous empyema, and even of a clear tuberculous effusion, has rendered surgery difficult, unsatisfactory or even impossible.

Foreign bodies in the pleural cavity are found as a result of injuries, gunshot wounds or previous operations. These should be removed. Their presence constitutes a reason for continued suppuration, or causes future trouble from continued irritation. Cysts and benign tumors occasionally arise from the pleura. Malignant tumors are most often metastases, but when primary should be removed by radical resection of the involved area and adjacent structures.

LUNGS

The end results of infection and suppuration of the lungs may range through a variety of conditions from unresolved pneumonia to severe and bilateral bronchiectasis. Single discrete abscesses may occur after various types of operations, often after tonsillectomy. These should be recognized early, and when communicating with the bronchus and centrally situated, will sometimes clear up with adequate general treatment, postural drainage and bronchoscopy. Should the abscess be at the periphery, or not opening into a bronchus, external drainage is necessary (fig. 2). Those not recognized early are apt to become chronic, and these chronic abscesses will not respond to any measures except external drainage. Frequently there is encountered pulmonary suppuration, and very often in combination with multiple abscesses and varying degrees of bronchiectasis (fig. 3). For these conditions we have at our disposal phrenicectomy, thoracoplasty and removal of the diseased area with the cautery. These processes are often very extensive, involving the entire lung.

Bronchiectasis begins frequently in childhood or adolescence, with definite and persistent spitting of pus. These cases do not as a rule come to the thoracic surgeon until years later, often after some acute infection has made the process become so much aggravated that the condition is unbearable.

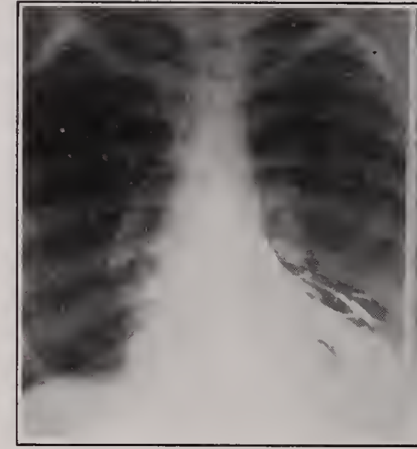

Fig. 4

Fig. 4. Unilateral bronchiectasis

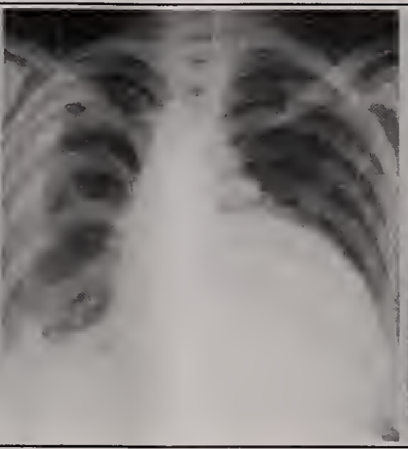

Fig. 5

Fig. 5. Acute pericarditis with effusion.

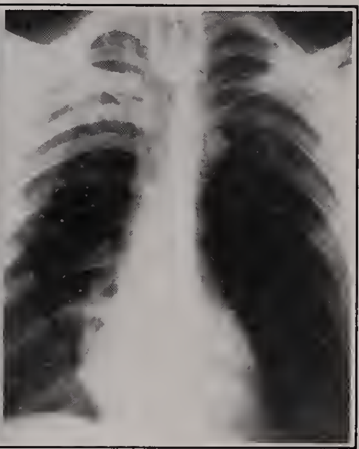

Fig. 6

Fig. 6. Stricture of esophagus.

At this time the affliction has frequently become bilateral and so extensive as to offer no hope of relief, or at best only slight palliation. For those unilateral lesions, particularly when confined to the lower lobe, various methods of palliation and cure have been brought forward, ranging from phrenicectomy to lobectomy (fig. 4). Thoracoplasty in certain cases will produce excellent results, though the ultimate aim must be the eradication of the diseased area by lobectomy. Safer and better ways are being developed to perform this, and the heretofore prohibitive mortality is constantly being lowered. The earlier the cases apply for relief, the more prospects there are of cure.

A great deal of study has been done on the subject of atelectasis. Plugging of the bronchus with mucus or other plug seems essential to its production. The clinical picture is very similar to that of pneumonia, but the chest is flat and the heart and trachea are drawn to the affected side. This condition may be prevented by the use of carbon dioxide and oxygen postoperatively, or cured if already present. Occasionally bronchoscopic removal of the obstruction is essential.

Tuberculosis I shall mention only briefly, as I am sure you are all familiar with results of its surgical treatment which has become universal in this country. Phrenicectomy alone is often curative, and will produce at times surprising results, even in large apical cavities. It may be used despite considerable involvement of the other lung as it is a simple procedure, and no immediate harm results. Its beneficial effect will often extend to both lungs. Temporary paralysis by freezing or other means may be used first on one side and then later on the other. Phrenicectomy is being used earlier and more often with or without a combined pneumothorax.

Thoracoplasty in two or more stages in suitable cases has saved thousands for whom there otherwise was no hope. Various types of pneumolysis, both intrapleural and extrapleural, allow the compression of large cavities and adjacent disease, while saving the rest of the lung.

The improvement in the results for removal of tumors of the lung will depend largely on earlier diagnosis. They are not so rare as was formerly believed. Successful operations are being done for both benign and malignant growths, but too often there are metastases of the malignant type which render removal out of the question.

Cysts such as ecchinococcus may be removed or drained. The removal of foreign bodies from the bronchi is commonplace, as is the treatment of stenosis and the diagnosis and occasional cure of tumors.

PERICARDIUM AND HEART

Pericarditis is not infrequent, and pericardial effusion of any degree should be aspirated to avoid embarrassment of the heart function (fig. 5). When the effusion becomes purulent, external drainage should be established with washing out of the pericardial sac, to decrease mortality and lessen the after ill effects. Tuberculous pericarditis is relatively common, and may leave the same end results as the pyogenic type. In many cases after the inflammation has subsided the pericardium is left adherent both to the heart and to the surrounding structures, notably the chest wall. At every systole the heart now has to pull against the unyielding structures. Cardiolysis, or removal of the ribs and periosteum, leaves only a soft flap for the heart to pull against, and in cases not too far advanced excellent results are obtained. Occasionally other measures may be necessary, as an attempt to free adhesions within the pericardium, or removal of the pericardium in cases where this forms a constricting envelope which does not allow proper diastole of the heart. This is most marked in those instances in which the pericardium has become calcified. Removal of this stony shell allows the organ to again function in a more or less normal manner.

The heart itself is subject to injury, such as stab and gun-shot wounds, and by prompt action and suturing many cases are saved and restored to normal activity. Newer and better ways of such suturing and repair of wounds are constantly appearing. Work is also being done on the effect of atmospheric pressure on the contents of the open pericardium, whose normal situation is in a region of negative pressure. The surgery of the valves of the heart, notably the relief of mitral stenosis, is still in the experimental stage, but holds much promise.

ESOPHAGUS

This organ is subject to a variety of pathologic conditions, including ulcer, spasms, stricture, idiopathic dilatation, diverticulum and tumors, both benign and malignant. The peptic ulcer occurring at the cardiac end may be successfully recognized and treated as, of course, may cardiospasm. One thorough dilatation of the latter condition will usually result in cure. Strictures of various kinds are not uncommon, and, as a rule, may be relieved by repeated dilatation. If they are impermeable, gastrostomy and short circuiting operations will become necessary (fig. 6). Dilatation either congenital or idopathic will at times necessitate an anastomosis between the dilated esophagus and the stomach through the diaphragm.

Divertcula are rather common and usually well marked by the time relief is sought. The ordinary site is in the neck at the commencement of the esophagus, and they may be successfully removed by a two stage operation. The symptoms of dysphagia and regurgitation of food are unmistakable. Tumors are occasionally benign, as lipomata, but the most common and outstanding tumor is carcinoma. The only means of cure is radical removal, and it is particularly unfortunate that these cases are not recognized earlier, as they are slow to metastasize. Slight difficulty in swallowing, even though transient, in a person over thirty-five should be immediately investigated with care, to rule out this condition. While removal of tumors is difficult because of their inaccessibility, the necessity for an approach through other structures, and the fact that there is almost invariably leakage from the anastomosis, technical advances are numerous and will result in safer ways in dealing with this condition.

MEDIASTINUM

The various portions of the mediastinum are not infrequently subject to inflammation and suppuration from a variety of causes. Drainage becomes imperative. Formerly a uniformly fatal condition, mediastinitis is attacked through various approaches, and frequently cured. Tumors both benign and malignant arise in the mediastinum, and many can be removed, particularly benign tumors such as dermoid. Malignant tumors such as lymphosarcoma and Hodgkin's disease it is usually not possible to eradicate, but often a decompression can be done by splitting the sternum, or removing the ribs and providing considerable temporary relief, as well as facilitating roentgen treatment, which many times has a very beneficent influence.

VESSELS AND NERVES

These structures have been much studied recently, particularly in the case of the latter. The surgical applications of these studies are still comparatively few. I need only mention in connection with the arteries that intrathoracic aneurysms have been successfully ligated, and rarely emboli removed from the pulmonary artery in moribund patients, with prompt restoration of life. You are familiar with the great amount of work which has been done on the sympathetic nerves in the treatment of various conditions involving the upper extremities, and the surgery of the intrathoracic nerves and ganglia has barely begun.

These remarks have been by necessity random and sketchy, but I hope that they will at least stimulate more interest in more prompt diagnosis and better treatment, and a more comprehensive appreciation of the surgical possibilities of the thorax and its contents.

Experiences with Periarterial Sympathectomy in Fractures of Lower Extremity. Ralph Colp and Sigmund Mage, New York (*Journal A. M. A.*, Oct. 10, 1931), call attention to the fact that periarterial sympathectomy seems to have a physiologic basis for application in the problem of fracture repair. In a series of seven recent fractures of the lower extremity there was a diminution of time in obtaining clinical union of eleven days, and in hospitalization of nineteen days, and no case showed a tendency toward delayed union. In a series of ten cases of delayed union in fractures of the lower extremity which were ununited after an average of seventy days, clinical union resulted twenty-one days after sympathectomy in eight cases.

THE DIAGNOSIS AND TREATMENT OF MYXEDEMA*

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ANN ARBOR, MICH.

It seems worthwhile to emphasize periodically the diagnosis and treatment of myxedema for several reasons but among the more important are the following: First, although it is a relatively common disease, a patient may consult many physicians before the true condition is recognized; second, it is a disease for which we possess a cure and to overlook the correct diagnosis results in a grave injustice to the patient; third, although the relief of myxedema is accomplished by the relatively simple therapeutic application of desiccated thyroid gland, yet often patients are given an incorrect dosage of this preparation and a large majority relapse on account of their lack of cooperation or due to inadequate medical supervision.

Myxedema is most frequently observed in persons of middle age or older but it may occur in young adults in whom the recogntion of the disease may be difficult. The cause of the condition has long been known to be due to an underfunction of the thyroid gland which usually arises spontaneously. Less frequently it follows excessive irradiation of the thyroid gland for the treatment of toxic goiter or following operative removal of a major portion of the gland for the same purpose. The latter two causes are of minor importance, as roentgen-ray therapy is not used extensively at present in the treatment of toxic goiter and when employed the methods of controlling this form of therapy are perfected to such a state that excessive irradiation is unlikely. Likewise, it is relatively rare to observe postoperative myxedema, considering the frequency of subtotal thyroidectomy and large proportion of the gland which is usually removed. The most common cause is an atrophy of the secreting cells of the gland without recognizable cause which may reduce it to a functionless fibrous band.

The frequency of myxedema is impossible to estimate as doubtless the disease is not recognized in a considerable number of patients. My own interest in the condition originated in Massachusetts where it was not rare, and four years experience in Michigan has convinced me that it is more common in goitrous regions, as has previously been noted by other observers. Although Gull's original communication described the disease in women, it may occur in both sexes and is by no means rare in males.

In my opinion, the difficulty in recognizing the condition is due to two main reasons; first, because the possibility of the disease is not kept in mind by the physician; and, second, because it is almost impossible to obtain an authentic history on account of the patient's dulled mentality. Information elicited from the patient's relatives or friends will usually reveal that over a period of years they had noticed a gradual transformation in the patient from an enterprising, alert individual who had normal interests in life to one who lacks initiative, is uninterested in his surroundings, thinks slowly, is inattentive and has difficulty in pronouncing his words in a voice which has changed from normal to one of a husky, "squawky" character. Simultaneously with these changes there appears the characteristic solid edema which consists of an infiltration with a solid homogeneous material of a mucilagenous character. This is most marked in the skin, subcutaneous tissues and mucous membranes but may occur in the viscera as well as in voluntary and involuntary muscles. As a result of this infiltration, there is a most typical appearance of the face which, when once observed, instantly suggests the diagnosis when subsequent patients with the disease are encountered. The outline of the face becomes oval, puffiness is present about the eyes, and there is a striking lack of facial expression. While the myxedematous swelling may be uniformly distributed about the body, it is more conspicuous in the face, the supraclavicular spaces, the calves of the legs and about the ankles.

Other characteristic findings are observed in the skin and hair of the body and scalp. The skin is dry, inelastic and roughened. It resembles somewhat the skin of a very elderly person. The hair of the eyebrows, over the body, in the axillae and the pubic regions is sparse or entirely absent. Likewise there is usually a diminution of the hair of the scalp, sometimes along the edge of the hair which has been described as a "border band of alopecia," but more often the thinning is uniform over the entire scalp. The hair is dry but is not necessarily of coarse texture as some observers have stated. The finger and toe nails are hard, dry and brittle and are easily broken.

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* From the Department of Internal Medicine, University of Michigan.

* Read before the Ninth Annual Meeting of Pacific Northwest Medical Association, Seattle, Wash., June 25-27, 1931.

SYMPTOMS ASSOCIATED WITH A DECREASE IN THE BASAL METABOLISM

One of the most characteristic findings in myxedema is a reduction in the basal metabolic rate which usually averages between —20 and —40 in untreated patients. As this test is below normal in only a few conditions, it is of unusual value in the diagnosis of myxedema, and the study of a patient suspected of having this disease is incomplete until accurate determinations of the basal metabolism have been obtained. The presence of a lowered metabolism means, of course, that the heat production is diminished and this is directly responsible for some of the patient's chief complaints. One of the most constant symptoms associated with a lowered metabolism is a susceptibility to cold. These patients complain of being "chilly" when others in the same surroundings are perfectly comfortable. They invariably wear more clothing and require more bed clothes than the average person. Due to this low heat production they tolerate warm weather very well. As they do not have an excess of heat to eliminate, it is exceedingly rare for such a patient to perspire even when exercising in the warmest weather. It is also true that almost all patients with myxedema have a tendency to a subnormal body temperature which is often 97° F. or less by mouth.

With the low level of metabolism and also the decreased activities of these patients, they are able to maintain or even gain in body weight, although usually their appetite is poor and food intake is low. Contrary to the usual belief, patients with myxedema are not characteristically obese, although their body bulk may be somewhat over normal. Judging from the weight which is lost following treatment with desiccated thyroid gland, it can be estimated that the average patient accumulates between fifteen and twenty pounds as a result of the disease. In uncomplicated myxedema there is usually a bradycardia when the patient is at rest and this is indirectly associated with the low basal metabolic rate. Theoretically the circulatory rate should be less in a patient with a low basal metabolism as the heat production and, therefore, the oxidative processes are reduced in the tissues and the demand for transportation of oxygen from the lungs to the tissues is diminished.

THE RECOGNITION OF ATYPICAL TYPES OF MYXEDEMA

While there should be no difficulty in recognizing the typical picture of myxedema, there is a group of patients in whom some of the characteristic symptoms are lacking or are vague and uncertain. Recently a patient was seen who presented the classical picture of myxedema, including a low basal metabolic rate, with the exception that mentally he was overalert rather than sluggish. This patient did not present a real problem for diagnosis because his other symptoms were so characteristic. Certainly with one exception, the diagnosis of myxedema should not be entertained unless the basal metabolic rate is diminished below normal. Minor variations in the rate, as those which occur between —15 and —20, should not be considered significant unless other convincing clinical evidence of the disease is present. I have seen one patient with well developed myxedema who had a basal metabolic rate within normal limits but this was probably accounted for by the associated severe anemia. It is known that an advanced anemia produces a moderate rise in the basal metabolic rate, which may counteract the reduction of the rate due to the lack of thyroid seceretion.

During the past few years, there has been a tendency to regard rather a large group of patients as having hyperthyroidism who do not present the classical picture of myxedema with dry skin, diminished hair, the subcutaneous solid edema and other characteristic findings. The outstanding complaint of these patients is ease of fatigue which compels them to exert every effort in order to accomplish their ordinary daily tasks. Additional symptoms are constipation and vague gastrointestinal complaints, rather frequent mild headaches, and in the female patients occasional menstrual disturbances. Frequently these patients are underweight. The basal metabolic rate is usually between —15 and —30. While some of this group may be suffering from an underfunction of the thyroid gland, it seems that many must have a lower basal metabolic rate as the result of undernutrition and that the remainder of these symptoms may be explained on a neurasthenic basis. In those patients who present sufficient evidence of myxedema to warrant serious consideration, a course of therapy with a reasonable amount of thyroid gland is justifiable as a therapeutic test. The dose of desiccated thyroid gland should not exceed three or four grains daily and the patient should remain under rather close observation until the diagnosis of myxedema has been established or disproven.

COURSE OF THE DISEASE IN UNTREATED PATIENTS

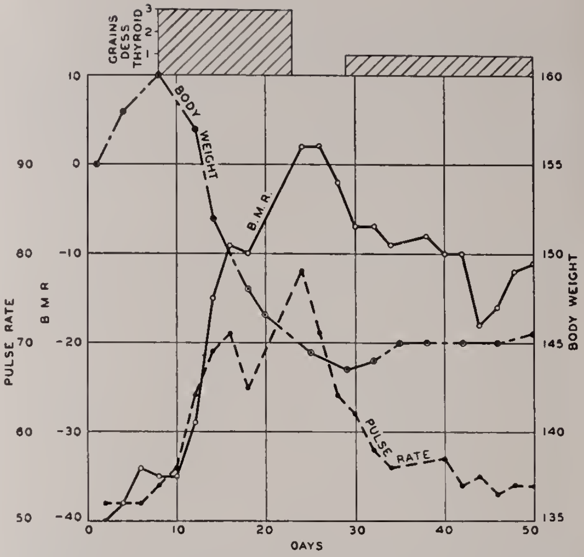
The course of the disease is usually progressively downward in untreated patients, although occasionally there have been spontaneous recoveries. Most patients gradually become incapacitated until they are no longer able to perform the simplest tasks and become entirely dependent. Various complications may arise which influence the course of the disease. In a large proportion of patients in whom the disease is well established, an anemia of moderate severity may develop but in some instances this is extreme and may simulate pernicious anemia. Some observers have considered that the two diseases may coexist in the same patient. Psychic changes of a moderate extent are usually present in most patients with the condition and not infrequently they may become extreme and warrant commitment to an institution for mental diseases. As there is a tendency to a generalized arteriosclerosis, as in diabetes, it is not surprising that the syndrome of angina pectoris or coronary thrombosis should be encountered in this group of patients.

TREATMENT

The treatment of myxedema with thyroid gland was first brought to the attention of the medical public by Dr. George Murray in a paper which he read before the British Medical Association in July, 1891, entitled "On the Treatment of Myxedema by the Hypodermic Injection of an Extract of the Thyroid Gland of the Sheep." About one year later (Oct. 29, 1892) two papers appeared simultaneously in the *British Medical Journal,* one by Dr. Hector Mackenzie and the other by Dr. E. S. Fox, which reported that thyroid preparations were effective when fed to myxedematous patients by mouth. Since that time the treatment of myxedema has been regarded as a relatively simple procedure and one which invariably produced satisfactory results. As previously mentioned, however, there is often a failure, partial or complete, to effect a cure because the treatment has been administered without careful oversight and the complete cooperation of the patient has not been obtained.

THE USE OF DESICCATED THYROID GLAND

The most satisfactory method of administering desiccated thyroid gland is to divide the treatment into two stages: (1) the initial dosage which is calculated to bring the metabolism from the original low level to approximately normal limits, and (2) the dosage which the patient must continue daily thereafter in order to maintain the metabolism at a normal level.



The effect of desiccated thyroid gland on the basal metabolic rate, resting pulse rate and body weight in a patient with myxedema. Three grains of this preparation were given daily for a period of fifteen days with the result that there was an increase in the basal metabolism from minus 40 to plus 2. The pulse rate increased from 53 per minute to 78 per minute and there was a loss of thirteen pounds in body weight. At the end of this period of treatment, the patient complained of slight palpitation and increased warmth. All treatment was omitted for six days and then a maintenance dose of one grain daily was given. This caused the basal metabolsm to remain in the vicinity of minus 10, the resting pulse rate at approxmately 55 per minute, and body weight remained constant at almost one hundred and forty-five pounds. The small dosage which was highly effective in this case was given because the patent had a moderately severe anemia.

Experience has shown that the amount of dried thyroid which is necessary to bring the metabolism from the low initial level to normal varies considerably and bears no constant relationship to age, sex, body weight, duration of the disease or severity of the symptoms. The only safe plan is to administer a reasonable dosage of the gland over a variable period of time until satisfactory results are obtained. An average dosage in a patient with untreated myxedema is two grains three or four times daily for a period of five or six days. During this period, however, the patient should be under observation and the effect of the therapy judged by the following: (1) the clinical response of the patient, (2) the effect on the basal metabolic rate, (3) the resting pulse rate, (4) the body weight.

As a rule the earliest effect of the thyroid therapy occurs in three or four days and consists of a sensation of increased warmth and slight sweating. Often at this time there is a mild febrile reaction, the body temperature sometimes rising to 100° F. and the patient may complain of slight palpitation on exertion. With this there is usually an increase in the resting pulse rate of about ten beats per minute. The basal metabolic rate should be determined at this time and, if a satisfactory test shows it to be between —15 and —10, the patient should then be placed upon a maintenance dose. On the other hand, if the basal metabolic rate is lower than the above figure, and there are no symptoms of overdosage, the treatment should be continued in doses of six to eight grains daily for an additional two or three days and at the end of this time the basal metabolic rate should again be determined. Although the normal standards of the basal metabolic rate are given by DuBois as between —10 and +10, it has been found from experience that the best results in patients with myxedema are obtained when the rate is kept at about —10. When the basal metabolic rate reaches this level, therefore, the dose of thyroid gland should be reduced to the smallest amount which will accomplish this.

The maintenance dose of dried thyroid gland required for this purpose varies between one and three grains daily. The largest number of patients require two grains daily and this should, therefore, be prescribed as the initial maintenance dosage. Until it has been demonstrated that this amount of the preparation is satisfactory, the patient should report at intervals of every two or three weeks for observation. Such complaints as increased warmth, excessive sweating, dyspnea and palpitation, nausea and dizziness, indicate that the amount of desiccated thyroid which has been given is too large and accordingly the size of the dose should be reduced. On the other hand, a failure to relieve the complaints characteristic of myxedema suggests an increased dosage. The clinical impression concerning the proper amount of the preparation to administer should always be checked by a study of the basal metabolic rate and the resting pulse rate. An attempt should be made to keep the latter at a level of about seventy to seventy-five per minute.

During the first four or five weeks of treatment there is a loss of body weight which usually totals between ten and fifteen pounds. This is due to a disappearance of the characteristic nonpitting edema. After the treatment has been continued satisfactorily for two or three months there is a substantial gain of a similar amount of body weight which is associated with improved nutrition.

Regardless of the warning of the physician that the thyroid medication must be taken continuously, a great many patients relapse as they are prone to discontinue the medication of their own accord. This doubtless occurs because the omission of a single dose or even failure to take the preparation for a week or more is not followed by an immediate return of symptoms. Having omitted the medication for some time, without noticing significant symptoms, they are convinced that further treatment is unnecessary and eventually a complete relapse occurs during the next six to eight weeks. To obviate this possibility, all patients with myxedema should remain under observation for an indefinite period, the intervals at which they report depending on their ability to cooperate.

COMPLICATIONS WHICH INFLUENCE TREATMENT

It has previously been emphasized that patients with myxedema may have a serious myocardial involvement and an extensive generalized arteriosclerosis. As feeding thyroid gland increases the demand for the delivery of oxygen to the tissues, more work is rather suddenly demanded of the heart in order to augment the circulatory rate which is necessary to accomplish this. In patients with myxedema who show evidence of myocardial damage and in all elderly patients, thyroid medication should be given, therefore, with extreme caution. It is advisable to give such patients not more than three to six grains daily as the initial dosage and during the first week or ten days of the treatment they should be confined to bed. During the subsequent three or four weeks their activities should be limited and then gradually increased if no untoward symptoms arise.

An occasional patient wth myxedema is seen who has, in addition, the syndrome of angina pectoris. When the metabolism is low and the well developed picture of myxedema is present, the attacks of substernal pain may not be severe. Following treatment with desiccated thyroid gland, however, and with an increased strain on the heart, the attacks usually become more frequent and severe. In such patients desiccated thyroid gland should be given with the greatest caution and an attempt made to determine the minimal dosage of the preparation which will control the symptoms of myxedema and at the same time not increase the severity of the attacks of angina pectoris. In some patients it may be advisable to begin the thyroid treatment with as small doses as one-half to one grain daily and not attempt to increase the basal metabolic rate to a level more than —20.

A second, not infrequent complication, which is important from the standpoint of treatment, is the presence of an anemia. A moderate diminution of hemoglobin and the red blood cell count occurs with great frequency and occasionally the latter may be as low as two million per cubic millimeter. The reduction in hemoglobin throws an additional strain on the heart as the carrying capacity of the peripheral blood is thereby decreased and the circulation rate must be increased still greater in order to meet the demands for oxygen in the tissues. It is advisable, therefore, to administer desiccated thyroid gland with caution in all patients with myxedema in whom the red blood cell count is 3,500,000 per cubic millmeter or less and the hemoglobin below 65 per cent. In patients with a more extreme degree of anemia, it is advisable to consider one or two blood transfusions as a preliminary to the thyroid treatment. The anemia of myxedema gradually disappears with no other treatment than desiccated thyroid gland, although several months of efficient therapy may be required for this.

ROCKY MOUNTAIN SPOTTED FEVER

A SUMMARY OF PROGRESS*

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The early history of this disease can be traced back some sixty-five or more years and I think I am safe in saying that it has probably existed among the whites since the earliest settlements in the intermountain region, and more than likely was handed down to us by the Indians, though I believe there is no authentic report of the disease having existed among them.

Wilson and Chowning[1] report that so far as can be determined the first case of "spotted fever," "black fever," or "blue disease" in the Bitter Root valley, Montana, occurred in 1873 near Woodside. Gwinn,[2] in 1902, stated that from personal knowledge the disease had been prevalent in the Bitter Root valley since 1886, and that he was credibly informed it has existed there since the region was first settled by the whites. Hall,[3] still practicing in the Boise valley, Idaho, reported that he saw and treated his first case of spotted fever in 1883. Wright,[4] now ninety-six years old and residing in Portland, and who was one of the earliest physicians to practice medicine in the Boise valley, tells me that he treated two cases of this disease in the spring of 1865, one a man forty years old and the other a girl of eight years. Both cases were diagnosed as a modified type of malaria and were treated as such, and both cases recovered.

In 1893, when I saw my first cases, the condition was variously diagnosed as spotted fever, mountain fever, malaria, breakbone fever, black fever, black measles, blue disease, typhus fever, malignant purpura, smallpox, typhoid fever, cerebrospinal meningitis, or what have you, according to the individual ideas of the physician treating the case. Though the disease was more or less familiar to the older physicians of infested districts, no attempt had been made to study it or even describe its clinical symptoms. In other words, no one had suggested that we were dealing with a new or distinct disease and there was no reference to the disease in any then published writings or texts on medicine.

Stiles[5] says the first printed account of this spotted fever which he was able to trace is a summary given by (now) Lieut. Col. W. M. Wood, M. C., U. S. Army (retired), in a report to the Surgeon General's office, 1896. Soon after arriving at Boise Barracks, Idaho, Wood learned of the prevalence in that region of an unusual type of disease, known locally as spotted fever and, though at that time he himself had seen no cases, he collected statements regarding the disease in Idaho from Drs. L. C. Bowers, George Collister, J. K. Dubois, R. M. Fairchilds, D. W. Figgins, W. D. Springer, C. L. Sweet, and H. Ziph. Their statements referred mainly to the symptomatology of the disease and theories as to the cause. It may be interesting to add at this time that, shortly after making the above report to the Surgeon General, Dr. Wood himself contracted spotted fever of moderately severe type with uneventful recovery. I still remember the pride he manifested in showing us the palms of his hands months afterward, where the spots could yet be seen. Unquestionably Wood's report to the Surgeon General was the first attempt to describe this disease, but, like many other scientific matters, the report was given no special notice or publicity until years later.

About three years later (1899) I read a paper before the Oregon State Medical Association, at

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* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., Aug. 3-5, 1931.

[1] Wilson, L. B. and Chowning, W. M.: The So-called "Spotted Fever" of the Rocky Mountains. A Preliminary Report to the Montana State Board of Health. J. A. M. A., 39:131-136, July 19, 1902.

[2] Gwinn: Quoted from Stiles' report. Vide infra.

[3] Hall, O. W.: Symposium on Rocky Mountain Tick Fever. Discussion before Idaho State Medical Association meeting. Med. Sent., Dec., 1908.

[4] Wright, J. B.: Personal communication.

[5] Stiles, C. W.: A Zoological Investigation into the Cause, Transmission and Source of Rocky Mountain "Spotted Fever." Bull. No. 20, Hyg. Lab., P. H. & M. H. Service, U. S., April, 1905.

Portland, on "Some Observations on the So-Called Spotted Fever of Idaho." This paper defined the disease as "an acute, endemic, noncontagious, but probably infectious disease, characterized clinically by a continuous moderately high fever, arthritic and muscular pains, and a petechial or purpuric eruption in the skin, appearing first on the ankles, wrists and forehead, but rapidly spreading to all parts of the body."[6]

At the time of writing that paper I had no idea of pioneering, but it was interesting to note that following the published description of the disease scientific interest was soon aroused, investigation began in earnest, other papers soon followed, and in a comparatively short time our spotted fever was a not uncommon topic in medical literature. Bulletin No. 154, from the Hygienic Laboratory of the U. S. Public Health Service, lists a bibliography of about two hundred published articles on this disease, which does not include the descriptive articles appearing as chapters in textbooks of medicine. As evidence of the world-wide interest manifested, it is interesting to note that seven of these papers were published in Germany, two in Japan, and one each in France, England, and the Philippine Islands; the balance appearing in the medical literature of our own country. The most voluminous contributors to the literature of Rocky Mountain spotted fever have been H. T. Rickets, R. R. Parker, S. B. Wolbach, L. D. Fricks, R. R. Spencer, R. A. Cooley, H. Noguchi, C. W. Stiles, J. F. Anderson, and Wilson and Chowning, in the order named.

In Nelson's System of Living Medicine, Wolbach,[7] who was one of the Government's investigators, gives a very complete and readable description of Rocky Mountain spotted fever, wherein he defines the disease as "an acute specific infectious endangeitis, chiefly of the peripheral blood vessels, transmitted by a tick, *dermacentor venustus,* and characterized by onset with chill, continued fever, severe pains in bones and muscles, headache, and a macular eruption which becomes petechial and appears first on wrists, ankles, and back, then over the whole surface of the body." This, compared with my original definition, gives you some idea of the progress made in the study of this disease, for at the time of my first paper we knew nothing about its distribution, cause, method of transmission, the incubation period, pathology, immunity or prevention.

As the clinical features of spotted fever are the same as they were twenty, forty, sixty or more years ago and are amply described and readily accessible in current medical literature, I shall limit my further remarks to historical data as it relates to the advancement made in our knowledge of it.

Distribution and mortality. It has been found that Rocky Mountain spotted fever has a peculiarly limited geographical distribution. It is found only in regions infested with the wood tick, the principal habitat of which seems to be Montana, Idaho, Nevada, Oregon, Utah, Wyoming, California, Colorado, Washington, South Dakota and New Mexico. Sporadic cases have been reported from Indiana and other middle and eastern states somewhat recently. I am not familiar with the history of these distant cases but infer that the infection was carried east by man or animal. In these days of rapid transit there is ample time after infection to reach most any state in the Union before developing the disease. However, Rocky Mountain spotted fever is chiefly found in Idaho and Montana, the other states mentioned in the intermountain region reporting only occasional cases. Even in Idaho and Montana the disease is restricted to certain localities. In Idaho, for example, the great majority of cases originate in the foot-hill districts on the north side of the Snake river valley; while in Montana, the west side of the Bitter Root valley and adjacent foot-hill slopes is the chief infested district. Infections seldom occur on the south side of the Snake river valley or the east side of the Bitter Root valley.

The number of cases occurring annually varies, in all sections, from 295 or less to 750 cases. Most of the cases occur in the spring months, usually in April and May, some occur in March or earlier and some in June or later, depending in a great measure on the advancement of the season and the amount of rain or sunshine. Dry, sunshiny days are essential factors in the life history of the tick. Cool or rainy days render the ticks dormant and inactive and in this condition they seldom or never attach themselves to animals or human hosts. Then, too, fewer people are exposed during unfavorable weather in the spring because they stay at home.

The mortality rate varies in different localities and from year to year. In the Idaho cases the mortality averages less than 5 per cent, sometimes as low as 3.5 per cent, while in the Bitter Root valley of Montana the mortality in unvaccinated cases has ranged from 70 to 90 per cent. In all localities the mortality rate is higher in adults than children, and has been especially high in old or debilitated persons. All ages and both sexes are attacked by the disease, if exposed to infection.

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[6] Maxey, E. E.: Observations on the so-called Spotted Fever of Idaho. Med. Sent., Oct., 1899.

[7] Wollbach, S. B.: Rocky Mountain Spotted Fever. Nelson's System of Living Medicine, 2:215-217 F.

Cause and method of transmission. Concerning our early ideas as to the cause of spotted fever, it may be of interest to make brief reference to my original paper. At that time I expressed the opinion that the disease was contracted while the patients were residing or sojourning in or near the foothills of the mountains. I had carefully investigated this question of residence in every case coming under observation and found that without exception there was a history of a longer or shorter residence, just prior to the sickness, in or near the mountains or along some mountain stream, where the sole water supply came from melting snow. My conclusions were that in all probability the disease was caused by some peculiar organism, possibly a miasm. In fact, most every physician having experience with the disease at that time had his own ideas as to its cause, but most all were more or less agreed in attributing it to some altered or contaminated condition of water or soil.

In 1901 the Montana State Board of Health began its study of the disease by having the water and soil of infected areas examined, but Dr. Starz, who made these examinations, was unable to find anything that might contribute in causing the disease. The following year Drs. Wilson and Chowning, of the University of Minnesota, were employed to make a laboratory study of the disease and of infested areas. In their preliminary report they described a hematozoon which they had found in the blood corpuscles of spotted fever patients and of gophers found in the vicinity, and they advanced the theory that the tick was a probable means of transmitting the disease from gopher to man. This was the first specific organism discovered in the blood of spotted fever patients and Wilson and Chowning were the first to suggest the tick theory of transmission. Cobb and Wesbrook, in 1902, and Anderson, in 1903, were all able to substantiate the findings of Wilson and Chowning, but in 1904 Stiles and Ashburn, after an exhaustive study of patients and animals, were unable to demonstrate Wilson and Chowning's pyroplasmic organism in blood from patients or animals, and even failed to see the organism in numerous slides prepared and supplied by Wilson and Chowning. Subsequent observers, also, have failed in demonstrating a pyroplasmic organism in the blood of spotted fever patients. I am unable to say just what has become of Wilson and Chowning's hematozoon. In any event it has long since been discarded and forgotten as a causal factor in Rocky Mountain spotted fever.

It is impractical to give personal mention to all of the investigators who have been working on this disease in the field and laboratory. The United States Public Health Service has had one or more, usually more, officers in their field laboratory at Hamilton, Montana, every year since 1902, and their work has been invaluable not only in verifying the causal factors but other factors to be mentioned later.

In 1906 Dr. Rickets, of the Chicago University, began his inoculation experiments, spending much of his time for the next three years in the study of the wood tick and in experimental inoculations of animals. In 1907 he demonstrated beyond a doubt the role of the wood tick in transmitting spotted fever to animals, and in 1909 reported the discovery of a microorganism which apparently had a specific relationship to Rocky Mountain spotted fever. Ten years later, Wolbach gave this organism the name *dermacentroxenus rickettsi.* "The microorganism is so small that it has been found difficult to study. A majority of the forms are bacterium-like, but the staining reactions are more like those of spirochaeta. This microorganism undergoes in the tick a morphologic sequence indicative of a life-cycle. The organism can be found in the lesions characteristic of the disease in the blood vessels, within endothelial cells and smooth muscle cells. In ticks the parasite multiplies within the nuclei of the cells of various tissues, as well as in the cytoplasm. In human tissues the form most easily demonstrated is a relatively large, deeply staining lanceolate form in pairs, in the neighborhood of one micron in length. In the tick three definite types are to be recognized: (1) A form present in early stages of the infection, a rod without granules, and staining faintly; (2) minute rod-like form with chromatoid granules, found within nuclei of cells, and in masses within the cytoplasm; (3) a relatively large lanceolate paired form, similar to that found in mammalian tissues. The evidence at hand points to the conclusion that this more deeply staining lanceolate form is the form in which the virus is passed between the tick and mammalian host."

Wolbach further states that in all probability the *dermacentroxenus* represents a new type of microorganism. "It may be of similar nature to the rickettsia bodies of typhus fever. Similar minute bacterium-like organisms, exhibiting the same peculiarities of staining, have been found in a number of species of ticks, lice and bed-bugs, and the hypothesis is justifiable that we are dealing with a pathogenc organism, probably adapted to insect life, and peculiar to insects."

In 1908, McCalla[8] reported the direct transmission of Rocky Mountain spotted fever from man to man by means of a wood tick. This experiment was made in a Boise hospital about three years before it was publicly reported, and, from personal observation of the experiment, including the examination of the patients involved, I can verify the authenticity of McCalla's report.

Incubation period. It has been found difficult to definitely determine the period of incubation, even when it is known when the tick first attaches itself to the body, for owing to the more or less indefinite period it takes the tick to feed or even begin to feed after attachment, it is not known at just what time of feeding the tick virus is transferred to the host. In McCalla's direct transmission experiments the first host developed the initial symptoms of spotted fever in three days from the time the tick was transferred to his body. The same tick was then placed upon a second host, but this patient did not show any symptoms of the disease until the ninth day. So, according to various observers, the period of incubation may be said to range from one or two days to ten or more from the initial tick bite.

Pathology. At the time of earlier experiences with spotted fever no postmortem studies had been made, at least none had been reported, and I still have no record of any critical postmortem study of the milder types of cases seen in Idaho. We knew from clinical observation that there always was a hemorrhagic eruption or extravasation of blood in the skin, these spots often coalescing into large blotches; we knew that not infrequently there was gangrene of pendant parts of the body, sometimes of the soft palate; and we knew that in some cases the spleen was demonstrably enlarged, but this is about all we did know or guess about the pathology of this disease. The intensive study of the Montana cases has demonstrated that, while there is very little to be seen postmortem that is striking, there are nevertheless some distinctive features. The eruption remains after death, the spleen is found to be large and firm, and the extensive hemorrhages into the scrotum and testes are, according to Wolbach, almost pathognomonic. Secondary infection of the spleen and bronchopneumonia are common complications.

"The characteristic pathology," to quote again from Wolbach, "is to be found in the blood vessels of the skin and subcutaneous tissues, and in the testes and appendages. Blood vessels of the skeletal muscles and thyroid gland are frequently involved. The early lesion in blood vessels consists of a proliferation of the vascular endothelium and an infiltration of the vessel walls with mononuclear cells and polymorphonuclear leucocytes. Degeneration of the proliferated endothelium is followed by thrombus formation. Heavy perivascular accumulations of mononuclear cells, presumably of endothelial origin, are common. The reaction of the endothelium, followed by necrosis, in small blood vessels of the skin, frequently is the mechanism of the cutaneous and subcutaneous hemorrhages, while other features of the rash are explained by occluding thrombi of small arteries and veins. The minute parasite of the disease may be demonstrated in the vessel walls, in endothelium and in smooth muscle cells of the media in relation to the thrombi. Minute focal necroses of the liver occur as in many other severe infections. The spleen shows marked engorgement with extensive phagocytosis of red blood cells. The lymphoid tissue is diminished in amount. A general reaction to the disease is shown by the accumulation of endothelial cells in the blood vessels of all the organs and in lymph-nodes. No lesions of the central nervous system have been found."

Immunity. It is now generally conceded that an attack of Rocky Mountain spotted fever gives immunity, probably permanent, to the disease, and in the experimental work with animals it has been conclusively demonstrated that with them also immunity follows recovery from the disease. It would be extremely interesting to detail the work of Spencer, Parker and others of the Public Health Service, and of Noguchi, in the experimental study of immunity in this disease, but time will not permit me to give more than a brief summary of their results, as given by Parker and Spencer.[9]

"1. Tests have been made in local sections of

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[8] McCalla, L. P.: Direct Transmission from Man to Man of the Rocky Mountain Spotted (Tick) Fever. Med. Sent., 16:87-88, Feb., 1908.

[9] Parker and Spencer: Results of Four Years' Human Vaccination. Bull. No. 154, Hyg. Lab., U. S. Pub. Health Serv.

Montana and Idaho to determine the value of phenolized tick virus as a prophylactic against Rocky Mountain spotted fever. The vaccine has also been distributed upon request to physicians in other infected areas of the Rocky Mountain region. The dosage used has been purely arbitrary and for adults has most commonly been two injections of 2 cc. each, at five-day intervals.

"2. The Montana test, against the *most virulent* type of infection, has been made in the Bitter Root valley during the four-year period, 1925-1928. The mortality among nonvaccinated adult cases was 90.91 per cent but among those vaccinated was only 9.09 per cent. The mortality rate for nonvaccinated adults for the twelve-year period, 1917-1928, was 84.91 per cent. The mortality among laboratory workers exposed to infection with Bitter Root valley strains was 100 per cent (5 of 5 cases) before the use of vaccine, but has subsequently been only 14.28 per cent (1 of 7 cases).

"3. The Idaho test against the *mildest* recognized type of infection was made in a small section of the Snake river valley of southern Idaho, during the seasons of 1926 and 1927. Because of the occupational incidence this test was confined to persons handling sheep on the range. During the two seasons one case occurred among 193 vaccinated men and 22 cases (1 in 16.55 men) among 364 controls. If only men in the sheep outfits exposed to greatest danger of infection be considered, there was one case in 168 vaccinated men and 13 cases, or one in every 9.3 men, among 131 controls.

"4. The Bitter Root valley data definitely show that partial protection, sufficient to insure relatively mild infections and recovery, is usually conferred against the extremely virulent strains of Rocky Mountain spotted fever. The southern Idaho data strongly suggest that full protection is commonly given against the milder type of infection which is prevalent in most sections of that region.

"5. Two additional cases have occurred among 1,506 persons vaccinated in other sections of the Rocky Mountain region. These were from a focus of virulent infection on Kirby Creek in Wyoming. Both recovered, and were the only recoveries of seven cases from that focus in the past three years. The results were apparently comparable with those against the similar highly virulent strains in the Bitter Root valley.

"6. The blood serum of vaccinated persons shows definite neutralizing properties.

"7. Reactions to the vaccine are no severer than those following the subcutaneous injection of other biologic products.

"8. *The vaccine has a definite value as a prophylactic against Rocky Mountain spotted fever.*"

I have italicized the last statement because it is the gist of their experimental work on immunity and gives us what we want to know. Rocky Mountain spotted fever can be prevented in Idaho where the virulence is mild, and in Montana where the virulence is severe it can be made mild and far less dangerous to life.

Prevention. Aside from the prophylactic use of vaccine the prevention of Rocky Mountain spotted fever is essentially a matter of avoiding the tick-infested areas. If one's occupation or pleasure takes him into the infested regions, suitable clothing should be worn, making it difficult for the ticks to gain access to the body, and while in this region one should strip frequently and examine the body and clothing for ticks. Poisoning or trapping the small rodents, the dipping of sheep, horses and cattle, and the clearing and cultivation of the land tend to limit the breeding and development of the ticks. Some years ago Dr. Fricks suggested grazing sheep over the tick-infested areas, as he had noted that most all of the ticks on sheep died before becoming fully engorged, but this is more a matter for state control. For the casual person, however, the best and surest prophylactic measure against Rocky Mountain spotted fever is to stay away from infested regions. If you must go into these districts, where there is any danger of contracting the disease, by all means take the prophylactic vaccine shortly before the necessary exposure.

STREPTOCOCCAL AGGLUTINS IN RHEUMATOID ARTHRITIS. Edith E. Nicholls and Wendell J. Stainsby, New York (*Journal A. M. A.*, Oct. 17, 1931), describe experiments in which they noted that the serum of patients with rheumatoid arthritis give a strong specific agglutination reaction with "typical strain" streptococci recoverable from the blood and joints of patients with rheumatoid arthritis. Such a reaction suggests that this type of hemolytic streptococcus is of etiologic importance in the disease. A close antigenic relationship between "typical strain" streptococci and the hemolytic streptococci from scarlet fever and erysipelas is established. Rheumatoid arthritis can be differentiated from osteoarthritis, chronic gout, gonococcal arthritis and other joint diseases by the agglutination reaction. The agglutination reaction, when supplemented by the sedimentation test, not only offers a valuable aid in differential diagnosis of arthritic conditions, but also affords an estimate of the activity of the disease and the progress of the patient.

A SPINAL ANESTHESIA RECORD SHEET

LOUIS H. MAXSON, M.D.
SEATTLE, WASH.

The large number of recent articles on spinal anesthesia denotes the present interest in this method. The widest difference of opinion exists, however, with regard to nearly every detail of technic. Some favor the sitting posture for the spinal puncture, others the lateral; some use high injections, others low; different drugs are favored, and different dosages of the same drug; some inject rapidly, others slowly; some use barbotage, others avoid it; some withdraw a large amount of spinal fluid, others but a few cc.; some attempt to control the level of anesthesia by posture, while others claim that the level is soon fixed and cannot be changed afterwards; some insist upon the Trendelenburg position in all cases, other feel that it produces the very effect which its advocates are endeavoring to avoid; some give adrenalin, some ephedrine, while others claim that these drugs have little or no effect; and so on.

The usual anesthesia chart, devised primarily for inhalation anesthesia, is not suitable for recording the technic and phenomena of spinal anesthesia. Others have undoubtedly felt the need of new forms and have devised them, but a suitable one has not come to our notice. Dr. Harold V. Larson, my associate, and I, therefore, submit the following chart which we are now using at Harborview Hospital. We believe that even a few months' careful recording of the data on this record sheet will enable us to arrive at valid conclusions on many of the questions now debated. We submit it with the hope that a similar form may be adopted wherever spinal anesthesia is generally used, and that the data accumulated in many thousands of cases will point the way to safe and efficient spinal anesthesia. The record is made in duplicate. The original goes with the patient's chart; we keep the carbon copies for statistical comparison.

Harborview Hospital Date ....
Room No.................. Case No....................

SPINAL ANESTHESIA RECORD
Drs. Maxson and Larson

Name ....
Age......... Sex............ Weight......... Physique..............................
Surgeons ....
Operation ....
Preliminary medication..

TECHNICAL DETAILS

Drug... Amount..............................
Ephedrine, gr..................... at.................... Position of patient:
Sitting..; On Side.................................
Puncture at.................... interspace. Amount of spinal fluid withdrawn................................cc. Barbotage............................
Time of injection......... Speed:.........sec. per cc.; total.........sec.

EFFECTS

Height of anesthesia: Primary...
Secondary ....
Length of anesthesia or operation..
Blood pressure: Highest..........................Lowest.........................
Trendelenburg: When.......................... Why...............................
Nausea................ Vomiting................ Treatment........................
Color............................ Mental attitude..

Time	B.P.	P.	R.	Notes

SEQUELAE

Headache................ Backache................ Paresthesia..................
Paralysis............................ Pneumonia......................................

....
Anesthetist.

ENDOCRINE ACTIVITY OF OVARY. According to Edgar Allen, Columbia Mo. (*Journal A. M. A.*, Oct. 24, 1931), the only sound basis for therapeutic treatment of menstrual disorders with hormones is a broad foundation of experimental evidence concerning the endocrine activity of the ovaries. He summarizes the recent work of follicular and corpus luteum hormones and sketches in outline a conception of the factors responsible for the periodic changes in the genital organs during the menstrual cycle. Attention is called to the fact that it has been shown in many animal experiments that the follicular hormone does not stimulate the development of follicles in the ovaries. Consequently primary hypo-ovarian conditions should probably be treated with anterior hypophysis extract when that is purified and biologically standardized. In cases of amenorrhea or scanty menstruation of long duration, treatment with follicular hormone has in a certain percentage of cases started cyclic activity which has in some instances persisted after cessation of treatment. In other cases it has not proved effective. Disturbances in the secretion of other endocrine glands, especially the anterior hypophysis and thyroid, should be ruled out before administration of theelin. Several reports have shown that theelin is sometimes effective in the treatment of extreme menopause symptoms, either operative or natural. A declining dose would be indicated in an effort merely to adjust the patient gradually from effects which are undoubtedly due to deficiency of this hormone. Progestin would be indicated for therapeutic use in cases in which repeated difficulty in carrying the embryo through the early stages of gestation is encountered. It might also be used later in pregnancy in combination with theelin to carry on the stimulation of growth in undeveloped mammary glands. First, however, it must be standardized biologically. The matter of the rather difficult test reaction for this active substance, at least compared with that for theelin, will probably postpone the early therapeutic use of progestin.

NORTHWEST MEDICINE
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Devoted to the Interests of the Medical Profession of the Pacific Northwest
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EDITORIAL

THE OREGON MEETING AT EUGENE

An advantage of holding a state medical meeting in a small city is observed in the large attendance at the various sessions, owing to the lack of extraneous attractions. This condition was emphasized at the Eugene meeting last month, as noted in the good attenedance during the three days of this meeting. All parts of the state were represented by visitors coming from nearly every city. The program was so arranged that a wealth of interesting and profitable papers were presented. There were sections on medicine and surgery morning and afternoon for three days, the last period of each morning and afternoon session being devoted to a paper by guests from other states. Thus a total of forty papers was presented at this meeting, making an unusually full program for a state society meeting. The reading of papers was not interfered with by the all-absorbing game of golf. The afternoon of the first day was assigned to this sport, the scientific program being held at the same time. Probably the continuous rain interfered to some extent with the activities of the golf enthusiasts. The guest speakers were Drs. A. C. Reed of San Francisco; Henry H. Dixon, recently of the staff of Colorado Psychopathic Hospital, Denver; Hans Lisser of San Francisco and J. Tate Mason of Seattle. Aside from papers by these visitors, all were products of members of the state society. The large attendance at each session was noticeable, with the free discussion that followed most readings.

The business of the society was transacted with expedition and completeness. The program for each of the three days was initiated by a seven o'clock breakfast, attended by members of the House of Delegates averaging a minimum of fifty members at each sitting. Consideration of business began promptly and occupied every moment until nine o'clock, the time for adjournment to the scientific sessions. This plan afforded abundant time for the full presentation of reports and consideration of all problems which were presented. This program for transacting business of the organization is to be commended to other state organizations.

The Woman's Auxiliary is an active factor in the life of the Oregon Society. The presence of Mrs. McGlothlan, president of the National Woman's Auxiliary, was the inspiration for special activities of the organization. It had a program occupying two days, including reports of county auxiliaries as well as those from the state and national organizations. Luncheons and teas figured in the various entertainments. The principal social function of the meeting was the annual banquet on the second evening, the chief speaker being President Arnold B. Hall of the University of Oregon, a very forceful orator,who discussed the matter of research in the state of Oregon, also dealing with relations between the medical profession and the state university. It was a frequent comment as the meeting progressed that this was one of the best and most profitable meetings of the state association. While the attendance was necessarily less than those commonly registering at the Portland meetings, the interest in all features of the program was equal to that of any past gathering of the society.

MEDICAL NOTES

BEWARE OF THIS IMPOSTER

Information has been received from the department of police of Bellingham that doctors of that city have been victimized by H. H. Harvey, alias H. L. Kerry, a former employe of W. F. Prior Company. He sold these doctors Tice's Practice of Medicine, cashed a check for the same and never delivered the order. An item in a recent issue *Journal American Medical Association* states that he is C. R. Matheson, former representative of Thomas Nelson & Sons. He is described as follows: Height six feet, 200 pounds, fair complexion, blue eyes, light hair very thin on top, ordinary features, talks with a slow drawl, is about forty years of age. He wears considerable jewelry and has a Canadian service button. It is well to keep this individual in mind.

COST OF MEDICAL CARE. The Committee on Cost of Medical Care has prepared and published eleven pamphlets on various phases of this problem. They range in size from forty to nearly three hundred pages with cost from twenty-five cents to a dollar and a half each. These may be obtained from The University of Chicago Press, 5750 Ellis Avenue, Chicago, from which a list of titles may be received on request. Twenty-five more volumes are in process of preparation. Taken as a whole, these will cover a wide range of study on this much discussed problem.

WHERE SMALLPOX EXISTS. Recent reports have been announced showing that India alone has recorded more cases of smallpox than the United States during the first half of 1931. During this period in India there occurred 63,376 cases as compared with 22,184 reported in the United States. England and Wales came next with 4,412 reported cases. None during that period were reported from Scotland, Germany, Italy, Netherlands, Switzerland, Philippine Islands and Lithuania.

Approved Hospitals. The report of the Hospital Standardization Conference of the American College of Surgeons for this year states that 2158 hospitals in the United States and Canada have been approved out of a total of 3319 institutions investigated.

American College of Physicians will hold its Sixteenth Annual Meeting at San Francisco April 4-8, 1932. Headquarters will be the Palace Hotel, where the scientific sessions, registrations and exhibits will be held. Clinics will be conducted in various hospitals and institutions in San Francisco.

Aeronautics Medical Director in Northwest. Dr. Harold B. Cooper, of Washington, D. C., medical director of the aeronautics branch, Department of Commerce, has been touring the Northwest to investigate the work of flight surgeons who are responsible for the physical fitness of pilots.

OREGON

The Oregon Pathological Society began its fall program on October 12, with a discussion of medical education and the Pathological Institutes of Germany and Austria by Dr. Frank R. Menne, who has just returned from six months of study in Europe. Also there was presentation of the autopsy findings in a case of stenosis of the esophagus, associated with pulsion diverticulum in which death resulted suddenly from impaction of meat in the diverticulum and larynx, by J. Irving Tuell. The following officers for the ensuing year were installed: President, Dr. Robert L. Benson; vice-president, Dr. Thomas D. Robertson; secretary-treasurer, Dr. Warren C. Hunter.

New Physician for Sweet Home. Dr. R. S. Langmack, recent graduate of the Washington University School of Medicine at St. Louis, has located in Sweet Home for the practice of medicine and surgery.

Psychiatrist Appointed to University Chair. Dr. Henry H. Dixon, formerly of Colorado Psychopathic Hospital, Denver, has recently joined the faculty of the University of Oregon Medical School. He will have the new chair in neuropsychiatry.

County Society Lecture. Dr. J. Morris Slemons, of Los Angeles, Calif., formerly Associate Professor of Obstetrics in Johns Hopkins University, and Professor of Obstetrics in Yale University, lectured before the Polk-Yamhill-Marion Counties Medical Society, at Salem, November 10. The subject was "Induction of Labor at Term."

Medical School Gets a Grant. The American Academy of Ophthalmology and Oto-Laryngology recently recognized work of Dr. Ralph Fenton for experimental work in diagnosis of sinus disease by granting him a sum of $200 to carry on his investigations at University of Oregon Medical School.

Elected Regent. The American College of Surgeons recently elected Dr. Ernst A. Sommer of Portland a member of its Board of Regents.

Dr. Milton V. Walker, of Springfield, has taken over the practice of Dr. Eugene Kester, his associate. Dr. Kester has been pursuing surgical studies in Los Angeles and Chicago for the past four months and now plans to continue study in European clinics.

Public Health Officer Returns. Dr. Edward A. Wier, former United States Public Health officer at Portland, from 1922 to 1927, has returned to Portland to replace Dr. Frank S. Fellows, who will supervise the health of Alaskan Indians.

Dr. J. R. Wetherbee, of Eugene, has returned from a two months European trip. During his visit he spent considerable time in clinics of England, Austria and Germany.

Union County Medical Society met October 1 at La Grande. Dr. W. R. Ross, the new president of the society, presented a paper on the subject of "Polycythenia Vera."

WASHINGTON

New Woman's Auxiliary. Washington State Medical Association is one of the few that has not organized a Woman's Auxiliary, as a component part of the Woman's Auxiliary of the American Medical Association. Last month a local Auxiliary was established in Seattle at the time of a visit from Mrs. A. B. McGlothlan, St. Joseph, Mo., president of the national organization. It is anticipated that in due time a state organization will be organized to function in connection with the state association. In other states this organization has been effective in promoting the interests of public health and benefiting in many ways the labors of the medical profession.

New Naval Hospital Unit Completed. One of the projects sponsored by the Government for the relief of unemployment was an expansion of the U. S. Naval Hospital at Bremerton. This work has been completed at an expenditure of $250,000 for building and equipment. The new unit adds 64 beds, so that the hospital is now equipped to handle 328 patients. It is staffed by more than one hundred men and women, including fourteen medical corps officers and three dental corps surgeons. The new unit is open for inspection to the general public and would make an interesting trip for visiting doctors.

New Hospital Staff Elected. Organization of the medical staff of the Walla Walla Sanitarium and Hospital for the coming year has been effected. Dr. Laura M. Miller was elected president of the staff. Dr. H. J. Flower of Milton-Freewater was named for vice-president and Dr. A. E. Lang, secretary-treasurer. The executive committee consists of Drs. J. C. Lyman, J. W. Ingram, G. R. Gowen, Elmer Hill and C. E. Montgomery.

Harborview Hospital Under Investigation. Drs. Arthur Crookall and W. T. Woolley have been named as a committee to investigate the criticisms of the conduct of King County's new $3,000,000 hospital. Investigation is expected to cover several weeks, when they will report back to the King County commissioners.

New Hospital Opened. Formal dedication of the new St. Mary's hospital took place October 25 at Astoria. The hospital was completed at a cost of $250,000 and is reputed to be one of the most modern institutions on the Coast.

Clinic Opened at Sedro-Woolley. Dr. Stanley W. Holton has recently extensively remodeled and enlarged his offices in Sedro-Woolley and has associated himself with Dr. Hilda Behrns, pediatrist, and Dr. R. K. Behrns.

Change of Everson Doctors. Dr. L. S. Van Gorder, formerly of Seattle, has purchased the Everson office and practice of Dr. E. S. Sarvis of Sumas. Dr. Sarvis will restrict his activities to his hospital and office at Sumas.

Dr. Arnold D. Johnson, formerly at the San Bernardino County hospital, has recently opened offices in the West Green Lake district in Seattle.

Wedding. Dr. C. A. Rutherford and Miss Marguerite Dober of Seattle were married in Tacoma October 17.

IDAHO

New Hospital for St. Anthony. Plans have been announced by Dr. T. A. Ellison for the construction of a hospital at St. Anthony. The building will be two stories, constructed of brick and cement, with accommodations for twenty-two patients. The hospital will be fully equipped with laboratory, roentgen-ray and physical therapy rooms. Expectations are that the building will be ready for use by the first of January.

Hospital Changes Hands. The Fremstad hospital at Bruley has been leased to Miss Anna Crabtree. Dr. Fremstad will continue his practice but will not have charge of the hospital.

Dr. E. C. Jensen, of Parma, has taken over the management of the county health unit.

OBITUARIES

Dr. William C. Cox, of Everett, Wash., died at his home September 25, aged 73. He came to Everett in 1891 and had been very active in all community enterprises. In 1895 he was elected mayor of Everett. He was a graduate of Jefferson Medical College in 1885. Previous to his residence in Everett he had located in Walla Walla and for a short time in Genesee, Idaho. For fourteen years he was local surgeon for the Great Northern and Northern Pacific Railways, and the Puget Sound Light Company. He was a member of the state board of medical examiners for a three-year period and was executive head of the Snohomish County Medical Society for five terms. In 1912 he was president of the state medical association.

Dr. Herbert N. Leete, of Twin Falls, Idaho, died at the county general hospital, October 2, aged 57 years. The cause of death was septicemia of three weeks duration. He was born at West Salem, Wis., in 1874. He was a graduate of the University of Wisconsin and received his medical degree at Rush Medical College in 1904. He came to Twin Falls from Northern Idaho in 1918 as physician and surgeon for the Northern Short Line. He was secretary of the South Side Medical Society last year and at the time of his death was coroner of Twin Falls county. His death resulted from infection developing in a scratch on the finger while working with a pet parrot's cage three weeks ago.

Dr. P. H. Jobst, Portland, Ore., died September 23 at St. Vincent's hospital, aged 62 years, after a two days illness. He was born in 1869. He was at one time a member of the faculty of the Marquet University School of Medicine, Milwaukee, Wis. He received his medical degree at Northwestern School of Medicine in 1894. He had retired from active practice in 1915.

Dr. Geoffrey J. Fleming, aged 58 years, a former Spokane physician, died October 9 at his residence in Ontario, Calif. He had been ill for several weeks with pneumonia. He was a graduate of the University of Illinois College of Medicine in 1898. He had practiced for a number of years in Spokane prior to locating in California.

REPORTS OF SOCIETY MEETINGS

WASHINGTON

KING COUNTY MEDICAL SOCIETY

Pres., R. J. McCurdy; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the Auditorium of the Medical-Dental Building, Seattle, October 5, President R. J. McCurdy presiding. About 210 members were present. Minutes of the general meeting of September 14 were read and approved.

Edward Le Cocq and E. A. Nixon were elected to membership. Applications for membership were received from W. C. Aylen, C. C. Carter, Walter Kelton, Glen McCaffery and H. F. Thorlakson.

A communication was read, giving time and place of United States Public Health Service examinations.

H. J. Whitacre of Tacoma read a paper on "The Problem of Organized Medicine." He described the plan of study set up by officers of the State association with the hope that some of its problems may be solved. Organization, economics and ethics were announced as the three major activities of the State association for the coming year. The "Committee of Seven" of the State association was discussed, which is to study problems of contract practice. The need of an established grievance committee was presented. An arbitration committee for each county society was advised, whose function would be to hear complaints of patients regarding medical charges and professional service for the purpose of clearing misunderstandings and preventing malpractice suits.

W. D. Read of Tacoma gave a paper on "Economic Questions Within the Profession." He discussed the establishment of the workmen's compensation act. Special attention was called to the Bridge clinic in Tacoma which absorbs every possible contract. Commercialism predominates over scientific medicine. Mass care can never take the place of brains of the general practitioner of medicine.

W. B. Penney of Tacoma presented a paper on "The Responsibility of the Individual Doctor in Meeting Organized Requirements." The most important questions for consideration are contract problems, lodge practice, fees, the publicity physician and lay solicitors. The criticism regarding physician's fees was considered. While a fee schedule is undesirable, unreasonable charges bring discredit upon the entire profession. These papers were discussed by O. A. Nelson, E. W. Young, A. H. Peacock, H. J. Davidson and A. O. Loe.

C. W. Sharples was appointed chairman on a committee of medical relations, with authority to appoint his own committee.

The medical section of the society held a meeting October 12 with D. H. Nickson in the chair.

K. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, discussed the work of this Bureau. He stated that he would keep in close touch with the committee of the state medical association dealing with these subjects.

Professor Hilding Berglund, head of the department of medicine, University of Minnesota Medical School, gave an address on "Some Fundamental Facts About Albuminuria and Their Bearing on the Question of Low Protein Diet." He discussed the pathology of the diseased kidney, showing how this might lead to protein leakage manifested by albuminuria in the urine. Concentration of the urine is most important in establishing albuminuria. The close relationship between protein intake and output was discussed. The subject of edema was considered and its relation to the ingestion of sodium salts. The important relation of diet to albuminuria was presented in detail.

PIERCE COUNTY MEDICAL SOCIETY

Pres., R. C. Schaeffer; Secy., W. B. Penney

The regular meeting of the Pierce County Medical Society was held in the auditorium of the Rhodes Medical Arts Building, Tacoma, September 22, 1931, Dr. R. C. Schaeffer presiding.

Dr. I. A. Drues showed roentgen-ray slides of four cases illustrating the value of lipiodol in diagnosis of diseases of the nasal accessory sinuses.

Dr. S. E. Light gave a paper on "Ringworm of the Hands and Feet," which was a comprehensive review of the subject, illustrated with lantern slides. He called attention to the increasing frequency of this disease and to the advisability of all physicians keeping it in mind in the examination of patients. He reviewed the different methods of treatment and stated that many cases were very obstinate in responding to any treatment used so far. This paper was discussed by Dr. Charles S. Pascoe.

"Conversatism in the Treatment of Nasal Accessory Sinuses" was the subject of a paper read by Dr. A. F. J. Hansen. He believes that radical surgery on the nasal accessory sinuses is very seldom advisable and the paper was a plea for conservatism in treatment. This paper was illustrated by several slides showing conditions before and after treatment and was discussed by Drs. Hillis, Janes, Cameron, Howe, Ludwig and Bell.

Drs. C. I. Drummond, G. C. Kohl and T. H. Duerfeldt were elected members of the society.

Mr. Schlarb gave a report of the business done by the Business Bureau during the first six months of operation.

SPOKANE COUNTY MEDICAL SOCIETY

Pres., W. J. Pennock; Secy., D. A. Palmer

The Spokane County Medical Society held its regular meeting in the Paulsen Medical-Dental Building Auditorium, Spokane, October 8. Dr. J. G. Cunningham was in the chair as President Pennock was out of the city. The scientific program was presented by the Sacred Heart Hospital Staff under the direction of Dr. John Busby as follows:

"Case of Acute Pancreatitis with Operation and Recovery," reported by Dr. J. Lynch and discussed by Drs. E. S. Jennings, W. E. Newman and Geo. Anderson.

"Two Cases of Fracture of Distal End of Femur," reported by Dr. W. E. Grieve and discussed by Dr. A. O. Adams.

"Case of Polypus of Ileocaecal Region," reported by Dr. C. W. Countryman and discussed by Dr. Joseph Aspray.

Following the regular scientific program, Dr. R. G. Leland, Chairman of the recently formed Bureau of Medical Economics of the American Medical Association, gave a short talk on the purposes of this Bureau and what they hope to accomplish.

WALLA WALLA VALLEY MEDICAL SOCIETY

Pres., F. M. Campbell; Secy., G. C. Daniel

A regular meeting of the Walla Walla Valley Medical Society was held at Walla Walla in October.

The scientific program was presented by Drs. T. T. Manzer, David S. Metheny and R. L. Zech of Seattle.

Officers for the coming year were elected as follows: Dr. R. W. Smith, president; Dr. J. W. Ingram, vice-president, Dr. E. J. Rhoades, secretary, and Dr. J. E. Vanderpool, treasurer.

YAKIMA COUNTY MEDICAL SOCIETY

President, Kay England; Secretary, Ralph Shirey.

The regular monthly meeting of Yakima County Medical Society was held at Yakima, Oct. 22. This meeting followed a postponement from the regular date.

Two very interesting papers were presented. One was by Dr. C. F. Eikenbary of Seattle on Fractures of the Femur in Children. The other was by Dr. Stephen T. Parker of Seattle on The Late Cutaneous Lesions of Syphilis.

Among the routine business transacted, following the scientific papers, was a decision of the Society to continue the work of the free school clinic as has been done in the past. The next meeting of the Society will be held at Ellensburg on Nov. 7, when Dr. Wm. Taylor will be host.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

Surgical Pathology of the Diseases of Bones. By Arthur E. Hertzler, M. D., Surgeon to the Agnes Hertzler Memorial Hospital, Halsted, Kan., etc. 211 Illustrations. 272 pp. $5.00. J. B. Lippincott Co. Philadelphia, Montreal and London, 1931.

Every surgeon who has tried to make a diagnosis in an obscure case of bone pathology has felt the lack of a comprehensive work on the subject. This book will be welcomed by all of them. Nothing superfluous is found in it and nothing of importance is omitted. All pathologic conditions of bones are covered and the bone tumors are so arranged and illustrated that the subject appears much simplified. All conditions are well illustrated both grossly, roentgenologically and histologically and each condition is presented in a concise way under the headings of pathogenesis, pathology and histology.

The list of references at the end of each chapter is not lengthy but the author gives a hint of what each is about which would save much time to one looking for specific information. This book is of value to all surgeons coming in contact with bone pathology and also deserves a prominent place on the roentgenologist's desk. To write a book on pathology that holds the reader's interest so firmly that he reluctantly puts it down when compelled is certainly an art and this is what the author has accomplished in this book. JOE BRUGMAN.

GONORRHEA IN THE MALE AND FEMALE. By Percy S. Pelouse, M. D., Associate in Urology and Assistant Genito-Urinary Surgeon at the University of Pennsylvania; Fellow of the Philadelphia College of Physicians, Philadelphia, Pa. Second Edition, Revised. 440 pages with 92 illustrations. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $5.50 net.

The keynote throughout this book is that gonorrhea is a surface epithelial disease, self-limited, if affecting either a closed pocket or a constant openly draining one, but of very indefinite duration, if involving an intermittently open and closed location. The chapters covering original investigations of the author, such as the peculiarities of the gonococcus, pathology of the tissues involved, gonophage, etc., little changed from the first edition, are good enough alone to make the book a most desirable one.

The style is literary and so smooth that for the first third of the book one wants to sit up and read the whole night. Later he gets a feeling that the author was not suffering from an inferiority complex, which becomes a conviction on reaching the part concerning the female. He takes a rather pessimistic attitude regarding her prospects and on the whole offers discouragement rather than encouragement on this subject. The inclusion of female gonorrhea, while completing this second edition, adds little to the real value of the book.

Throughout the book controversial subjects are handled without regard to other authorities and with an air of "every one being out of step but my Henry." The author's assertions are never argumentive but so subtly presented that one is almost convinced that he alone knows anything about gonorrhea. It presents his ideas marvelously and we feel that one would not make a mistake in using this book as his guide on the subject. It is good enough that the reviewer after finishing reading every page promptly bought a copy for himself. W. R. JONES.

A MANUAL OF CLINICAL LABORATORY METHODS. By Clyde Lettridge Cummer, PHB., M.D., F.A.C.P. Instructor in Dermatology and Syphilology, School of Medicine, Western Reserve University. Third edition, With 185 Illustrations. 585 pp. $6.75. Lea & Febiger, Philadelphia, 1931.

This third edition is still of convenient size because the author has omitted from the text many of the alternative methods and tests as well as many references. However, tests of acknowledged value in the diagnosis of disease are fully given. Excellent illustrations are given. The alcohol test meal is described. Its application may increase rapidly after becoming known to the laity. Procedures such as cistern puncture and Queckenstedt test on spinal fluid have been described, while Schilling's simplified method for the Arneth count, agglutination test for tularemia and undulant fever, sedimentation of red blood cells, etc., have been added. Also the section on the Kahn test for syphilis has been increased, while a presentation of the Kline reaction has been added. MOSIMAN.

THE DOCTOR AND HIS INVESTMENTS. Financial Policy and Technique for the Physician. By Merryle Stanley Rukeyser, B. LIT., M.A., Financial Editor, Medical Economics and Dental Survey, Etc. 330 pp. $2.50. P. Blakiston's Son & Co., Philadelphia, 1931.

The author states that physicians are amateurs in the field of economics and need disinterested guidance in investmen of their earnings. This volume is an accumulation of published essays pertaining to investments. Part I deals with investment policy for doctors. Part II discusses fields of investment for doctors. Part III discusses fitting investments for the doctor's needs. The burden of various chapters is to avoid the high-pressure salesman and seek advice primarily from a competent banker in whom confidence may be reposed. The physician engrossed in scientific labors cannot undertake to become an investment specialist. For his guidance this volume discusses bonds, stocks, real estate and other avenues of investment, comparing the advantages and disadvantages of each. While one will not discover the royal road to wealth by perusing this volume, he will be impressed with the necessity for caution which may help him to avoid common pitfalls into which so many physicians have fallen in recent years.

GYNECOLOGY AND UROLOGY FOR NURSES. By Samuel S. Rosenfeld, M. D., F. A. C. S., Adjunt Obstetrician and Gynecologist Lebanon Hospital, New York City. 230 pp. $2.00. Wm. Wood & Co., New York, 1931.

The author states that he attempts to emphasize what a nurse most needs to know in order intelligently to care for gynecologic and urologic patients. He is not trying to make doctors of nurses. He presents the essential features of anatomy, physiology and pathology of the organs treated under these headings. There is sufficient detail to emphasize essentials. The pathologic conditions generally treated in gynecology and urology are briefly considered with an outline of treatment and nursing care. This is a useful volume for nurses working with these classes of patients.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 15, No. 2. (Philadelphia Number—September, 1931.) Octavo of 303 pages with 37 illustrations. Per Clinic year, July, 1931, to May, 1932. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

This volume presents clinical reports from thirty-seven internists of Philadelphia, covering a great variety of medical conditions. Stokes discusses diathetic eczema which is the cutaneous phase of the eczema-asthma-hay-fever complex. This condition is often overlooked and frequently requires careful study for a diagnosis. Its various phases are herein presented, with suggestions for diagnosis and treatment. Most diathetics can be improved, nearly all made more comfortable, but few can be cured outright. Small considers products of streptococci in treatment of arthritis. The general principles of vaccine therapy are discussed and the technic presented for the employment of extractives of streptococci. Small doses are effective in improving patients with chronic, atrophic and hypertrophic arthritis. Intravenous administration offers greater possibilities. Golpin discusses the diagnosis and treatment of neurosyphilis, emphasizing the extreme importance of early diagnosis. He presents a historical review of the treatment of paresis. He notes the popularity of malaria treatment for these

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EPILEPSY AND GENIUS

The occurrence of epilepsy and genius in the same person is probably accidental, *Hygeia, the Health Magazine,* says in discussing the subject editorially. The traits exhibited by Julius Caesar, Paul of Tarsus, Mohammed, St. Francis of Assisi, Alfred the Great, Napoleon I, and Doiestoevsky were probably hysterical rather than epileptic.

COOLING PROCESS

How the ancient Egyptians first used the secret of cooling by evaporation is related by Doris W. McCray in he November issue of *Hygeia*. Shallow trays of porous material were filled with water and placed on beds of straw where they were left exposed to the night winds. In the morning a thin film of ice had formed over the surface. This practice is still being used today by natives of India.

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cases but thinks the results do not show any better treatment than that which is commonly used by most authorities. He is inclined to favor the employment of diathermy for the production of hyperpyrexia on account of its safety and easy control. Many other instructive clinical reports are found in this volume.

THE SURGICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 11, No. 5. (Pacific Coast Surgical Association Number — October, 1931.) 279 pages with 109 illustrations. Per Clinic year (February, 1931, to December, 1931.) Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1931.

This volume is of special interest, since its clinical reports are presented by surgeons on the Pacific Coast. While the majority come from California, the following writers are included from Oregon and Washington: J. E. Else, W. B. Holden and E. W. Rockey are contributors from Portland. From Seattle are included reports from A. B. Hepler, O. F. Lamson, J. T. Mason, J. W. Baker, G. W. Swift, P. G. Flothow and P. W. Willis, while cases also are discussed by A. A. Matthews from Spokane and A. W. Taylor from Ellensburg. An interesting collection of various surgical conditions will be found in this volume which offers a profitable field for study.

RADIATION THERAPY OF CARCINOMA OF THE RECTUM. Formerly Ira I. Kaplan, New York (*Journal A. M. A.*, Oct. 3, 1931), employed the method of intratumoral implantation of radium in the form of tubes or needles. Bearing in mind, however, the usual resulting ulceration incident to the puncture method of irradiation, he felt that, if he was to apply the same sort of irradiation as has proved so valuable in the treatment of cancer of the cervix and body of the uterus, he would succeed in enhancing his results in connection with cancer of the rectum and as a result he devised a new system of treatment. The method of procedure is divided into four parts: (1) general constitutional, (2) high voltage roentgen treatment of the pelvis and lymphatic drainage areas, (3) radium treatment directly to the lesion, and (4) postradiation treatment. Because of the pain associated with the rectal lesion, most patients are averse to having bowel movements, while others may suffer more or less from diarrhea; generally, they are weak, thin and dehydrated. To correct this condition, general and bowel hygiene is instituted daily, rectal lavage is given, and liquid petrolatum is administered by mouth. The patient is advised to take frequent meals of soft foods with high caloric value, and plenty of fluids are insisted on while the hygiene treatment is being carried out. In the administration of high voltage roentgen therapy to the pelvis, the x-rays are directed through two anterior and two posterior pelvic fields and a perineal portal. The amount given to each area is from one to one and a half full erythema doses in quarter doses per treatment, one or two areas being treated daily, depending on the condition of the patient. Following this roentgen therapy, radium is applied to the rectal lesion. If the lesion is on the surface superficial to the anal canal, irradiation is either by the intratumoral method of implanting the radium into the lesion or by applying a surface mask thereto. When the lesion is in the rectal canal, the technic is as follows: A specially designed rubber rectal applicator is prepared, containing the radium element in heavily filtered metal tubes. This rubber applicator has a central hollow core to allow for drainage of bowel fluids, cleansing, and escape of bowel gas. The inserted tip is of soft rubber and the rear end has a hard rubber connecting tube for attaching to an enema bag or to additional rubber drainage tubing, should the applicator be used high up in the rectum. The outer rubber shell is fenestrated at equal distances, to hold nine tubes, from 20 to 35 mm. in length and up to 5 mm. in diameter. A protective rubber sleeve is rolled over the bougie after the tubes are placed in the fenestras and this holds the radium in place. When the applicator is ready for insertion into the rectum, it is wound in puttee style, with a strip of 2-inch iodoform gauze, the end nearest the hard rubber outlet being slit so as to form two strings (like apron strings) which are tied over the tube in a large knot, with the long ends hanging loose for later use. After the tube is loaded, and wrapped with iodoform gauze, it is well greased with petrolatum and inserted into the rectum. Should the canal be blocked, it is dilated, sometimes a partial removal of tumor tissue is done, and the applicator is pushed in place. The long streamers of iodoform gauze are then strapped tightly with adhesive tape to each groin, and the knot on the tube is pushed in just behind the sphincter, which holds the tube in place. The number of radium tubes to be used and the dosage to be given depend on the position and type of the lesion being treated. While the tube is in place, the patient experiences but little discomfort, the hollow canal in the applicator allowing for the release of bowel gas and drainage. The patient is kept in bed in a moderate Fowler's position and given a fluid diet only. Ten minims (0.6 cc.) of deodorized tincture of opium is given three times a day. The length of time the tube is left in place depends on the dose to be given and the amount of radium employed. The dosages used by the author have varied from 2,500 to 8,000 milligram hours. After the planned for radium dose is given, the applicator is removed and the patient given daily enemas of salt water, and liquid petrolatum by mouth three times a day. The diet at first consists of fluid and soft foods, and gradually coarser foods are added. Following the radium treatment, a moderate colitis develops and may last for several weeks. Frequent rectal douches and at times a bland opium suppository ease the inflammation. If the treatment is well planned, healing takes place in two months and recession of the tumor will be more or less complete, depending on the involvement. Should the lesion recur, a second radium treatment may be given, but an interval of from eight to twelve weeks must be allowed before the second treatment is carried out.

GONOCOCCAL BACTEREMIA IN WOMAN, WITH CURE BY SURGICAL INTERVENTION. John H. Garlock, New York (*Journal A. M. A.*, Oct. 3, 1931), calls attention to the fact that in May, 1930, Wheeler and Cornell reported from the First Surgical Division of the New York Hospital a case of gonococcal bacteremia cured by operation. This probably represents the first case of its kind in surgical literature. Soon afterward, a patient presenting a similar condition was admitted to the Second Medical Division of the New York Hospital, and her case forms the basis of the author's communication. A detailed description of the illness of this patient is appended, because it was felt that the problem which presented itself is of considerable importance and that its solution opens up a new field in the therapy of this disease. On the basis of his observations in this case the author draws the following conclusions: 1. In certain cases of gonococcal bacteremia in women there may be an intermittent blood stream invasion. At the same time there may be little or nothing in the history, physical examination and clinical course to indicate the presence of a focus in the cervix, uterus or fallopian tubes. 2. The cause of an intermittent bacteremia presumably is a local focus with blood vessel involvement. 3. Operation in such cases should be considered. Timely and appropriate surgical intervention may offer the only chance of recovery.

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CLINICAL AMEBIASIS AND NEWER METHODS OF TREATMENT*

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Musgrave's term, amebiasis, has come into general use to denote parasitization of the human body with amebas. Of the five varieties of ameba found in the intestinal tract, only one is of undoubted pathogenicity, and in this paper amebiasis is limited to infestation with *Entameba histolytica.*

NATURAL HISTORY

Entameba histolytica is primarily, and probably strictly, a tissue parasite whose only portal of entry is through the intestinal tract. It exists in two forms, (1) the motile trophozoite or active form, and (2) the resting stage or cyst. Transfer is by cysts only, since active forms die quickly after leaving the body and are incapable of survival under natural conditions. Ingested cysts pass through the stomach, and, as Dobell has shown, excyst in the distal small intestine. An active quadrinucleate ameba crawls out of the cyst membrane and subdivides into eight amebas. These are carried out by the intestinal stream into the cecum and quickly penetrate the mucosa or into the depths of villi. It is rare for the terminal ileum to be invaded. The first site of election is the cecum. From here the infection may overflow or spread lower in the colon as the amebas are carried along by the colonic flow. They naturally penetrate the mucosa where mechanical conditions favor, as in the flexures, lower sigmoid and rectum. The appendix is frequently invaded and may constitute a focus of reinfection, especially if diseased so that drugs do not act freely upon it.

In the tissue a characteristic pathology is produced by a process of gelatinous necrosis. The amebas live in the border of healthy tissue in the submucosa and set up very little reactive process. The necrotic mass behind them tends to rupture through the mucosa, producing ulcers with characteristic raised, under-mined edges. Clinically, three points are to be emphasized. (1) The lesion may penetrate deeply in the intestinal wall, even reaching the serosa. This may result in adhesions, deep pockets and granulomatous masses. It also explains the facility with which amebas may invade lymph and blood capillaries. (2) Sooner or later secondary bacterial infection of amebic lesions takes place. This leads to important clinical considerations, such as production of fever, complications in symptomatology, lack of clinical cure with specific treatment and residual, often permanent, bowel damage after eradication of amebas. It also affords a portal of entry for systemic bacterial invasion, thus acting as a true focal infection. (3) The host-parasite balance is of utmost importance. Granting the presence of amebas, the optimum condition for the host is where the amebic colonies are not extending and where bacterial infection is absent. The optimum for the ameba is where the bowel is not disturbed in its physiology. Diarrhea and dysentery are easily excited, if the amebas become more active. Diarrhea results in decrease or absence of cyst formation and in extrusion of active trophozoites which promptly die. Thus clinically diarrhea is associated with presence of active amebas and disappearance of cysts, causing interference with transfer of cysts to a new host. This matter will be discussed under symptoms.

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* Read before the Fifty-seventh Annual Meeting of Oregon State Medical Society, Eugene, Ore., October 22-24, 1931.

INCIDENCE AND EPIDEMIOLOGY

Amebiasis must be accepted as widely and universally distributed over the world with its incidence increasing in direct proportion to warmth of climate, moisture, lack of general hygiene and sanitation, and facility of immediate transfer. James,[1] whose authority is not exceeded, reviewed all surveys since 1916 with reference to the incidence of amebiasis in North America, South America and England. He deduced that, where surveys were made by competent observers, the general population in the United States has shown an incidence of 5-10 per cent in centers where amebic dysentery itself is not endemic, and a higher percentage in endemic centers. James' experience showed that active forms of the ameba, excluding dysentery, are not accompanied by cysts in 50 per cent of positive cases. If this is true in temperate climates, then the 5-10 per cent incidence, founded on presence of cysts, should be doubled. He rightfully states that a parasite infesting 5-20 per cent of the general population, deserves attention. James concludes that *E. histolytica* should never be regarded even temporarily as a harmless commensal, but always as a subtle treacherous foe, and should be treated as such. Our survey experience with the inmates of San Quentin prison confirms his conclusions.

Spread of amebiasis depends solely on transfer of cysts. This is a mechanical process. Every case of amebiasis means previous ingestion of fecal material containing cysts. Dirty food and dirty fingers are almost entirely responsible. Contamination of food by infected food handlers is undoubtedly the most frequent method. Flies can ingest cysts and pass them still viable in their droppings. The infected cook or food handler is the chief menace. Prevention of infection lies primarily in eradication of amebiasis in all food handlers. Also, the invariable rule of the tropics should be extended to temperate climates, that the hands should always be washed immediately before preparing food or eating, and the fingers should never touch the mouth. The hot tea habit of the orient and the use of chopsticks have done much to curtail this and other infections in Asia. When one member of a family is found to harbor *E. histolytica,* all other members should be examined, as familial transfer is frequent and important.

SYMPTOMATOLOGY

The essential clinical classification of amebiasis divides the cases into dysenteric and nondysenteric. (1) Dysentery means increased number of bowel movements containing blood and mucus, and attended by pain. It results from disturbed host-parasite balance and is inimical to the amebic colony. It tends to show active amebas in the stools rather than cysts. It is more common in warmer climates. It easily follows such exciting causes as fatigue, worry, nervous strain, minor digestive upsets, chilling and intercurrent or concomitant infections. Brumpt attempts to explain the definite difference in incidence of dysentery in hot and cold climates by subdivisions or different races of *E. histolytica,* but his argument is not generally accepted.

(2) Nondysenteric amebiasis is much more commonly seen in temperate climates. It is well to remember that the underlying pathology is always the same and that every ameba-infested patient is a constant, serious and definite potential danger to himself and others. *No symptomatology* is *pathognomonic,* least of all in the nondysenteric type. The safest clinical rule is to examine for *E. histolytica* in every patient with any kind of gastrointestinal symptoms and in all obscure conditions and wherever a complete diagnostic review is indicated (vide infra, diagnosis). It is well to remember that about half of patients with amebic infection are subject to constipation, at least part of the time, and often alternating with diarrhea.

EXTRAINTESTINAL AMEBIASIS

Amebas have been demonstrated within blood and lymph channels of the intestinal wall. It is not difficult to understand their transfer to extraintestinal locations. When and why such transfer occurs is obscure. To what extent, if any, amebas migrate directly from the colon to other organs as the liver is quite unknown. For the clinician, a safe working rule is to consider the large intestine as the only portal of entry into the tissues. Therefore, amebic localization anywhere else in the body must presuppose a colonic lesion. The easiest and most common secondary focus is naturally in the liver.

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[1] Sixteenth Annual Report of United Fruit Co. (Med. Dept.), Boston, pp. 185-220, 1927.

Hepatic amebiasis is probably much more frequent than its diagnosis would indicate. Its pathology is essentially the same as in colonic amebiasis. A small or large number of microscopic amebic colonies are formed. Each develops by a process of gelatinous necrosis and these small so-called abscesses tend to coalesce and eventually reach the dignity of single or multiple classical liver abscesses. Secondary bacterial infection may take place or the mass may remain bacterially sterile.

The course is usually slow, cryptic, and the signs and symptoms obscure. Like dysentery, liver abscess is more common in hot climates but its presence must be suspected in all climates, especially where the obscure symptomatology may not be arresting. It is certainly more frequent in a previously damaged liver, where chronic passive congestion, alcohol and other irritants have paved the way. One cannot say that an undamaged liver is fully resistant to the ameba but its chance of successful invasion is certainly lower. Liver abscess often develops with no history of bowel disturbance.

The clinical picture is a textbook feature. Diagnosis rests on aspiration of characteristic material in which active amebas, and rarely amebic cysts may be found. Since the amebic colonization is in the periphery of the abscess cavity, organisms may not appear in the pus. Treatment is preferably not by open drainage, but by repeated aspiration and irrigation with weak emetine solution. At the same time, emetine should be administered hypodermically, 1 grain of the hypochloride daily to a total course not in excess of ten grains. At present we cannot be sure that it is safe to use arsenical preparations in amebiasis of the liver. This is a point needing careful study, especially since it is probable that many cases of colonic amebiasis are also subject to subclinical hepatic infection.

Amebiasis elsewhere in the body has been reported in the brain, lung, spleen, skin and urinary bladder. Unconfirmed reports have been made of its presence in glands and bone.

DIAGNOSIS

Diagnosis of amebiasis rests solely on demonstration of *E. histolytica*. Before reported as negative, stool examinations should be made on each of six consecutive days. Further, if negative after such search, then epsom salts should be administered and the liquid stool examined fresh for active forms and also the first formed motion following the salts should be examined. Stool examination should be two-fold. (1) Fresh direct smears in saline should be examined, unstained and stained by iodine or Kofoid's eosin-iodine method. (2) Fixed iron hematoxylin slides should be prepared and exhaustively searched. This routine should always be followed. Culture adds but little to percentage of positives. Certain identification should be made from iron hematoxylin slides. The most important feature of diagnosis is a competent technician. Without special training and experience, the examination is worthless.

CRITERIA OF CURE

We have arbitrarily set as a standard of cure freedom from cysts or active amebas for a period of three months after termination of treatment. Stool specimens are examined on three successive days in each two weeks. A period less than three months scarcely seems adequate to allow for multiplication of any amebas not destroyed by treatment to a sufficient number to be discovered on examination. A period longer than three months opens a serious probability of reinfection, since the patient usually continues to live in the same environment and with the same personal habits under which the original infection was contracted. This emphasizes the need of educating the patient at the time of treatment in the means of preventing infection (vide supra, epidemiology).

CRITERIA OF SATISFACTORY TREATMENT

A satisfactory treatment for amebiasis must be curative under the following conditions: (1) The drug must be nontoxic in clinical use. (2) It must be capable of oral administration. (3) It must interfere little, if at all, with the patient's ordinary activities. (4) It must require no adjuvant or concomitant treatment or regime. (5) It must be of low cost.

TREATMENT

Previous methods of treatment can be fairly well divided into four groups.[2]

(a) Alkaloids, such as those of ipecac and kurchi, (b) oxyquinoline derivatives, such as chiniofon ("yatren"), (c) organic arsenicals, such as acetarsone ("stovarsol"), and (d) miscellaneous antiseptics such as bismuth compounds, alkyl resorcinols and others. "These types of amebacidal agents have been critically evaluated (loc. cit.) on the basis of laboratory and clinical studies. Emetine, the most commonly used drug in amebiasis, is only partially effective in doses which too often are dangerous and there seems to be little hope of finding among the ipecac alkaloids a drug meeting the requirements for satisfactory treatment in this disease. The Kurchi alkaloids have little if any effective usefulness. Sufficient data are not yet available to judge properly of the value of the alkyl resorcinols, although they seem promising. It is indicated that more satisfactory drugs are to be found among the oxyquinoline derivatives than chiniofon, the only one so far exploited, but since systematic investigation of this group has scarcely begun, conclusions cannot be drawn at present. Of the organic arsenicals, only acetarsone has been much used in amebiasis, but experience shows it is only slightly effective and then at doses too often toxic."

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[2] Reed, A. C., Leake, C. D., Anderson, H. H., and David, N.: Carbarsone in Treatment of Amebiasis. To be published in Journal American Medical Association.

Our critical review, covering two years experimental and clinical work, together with a review of the literature of amebic therapy, shows that none of the recommended methods of treatment to date meets the requirements of the criteria for satisfactory treatment enumerated above.

At present we are studying a synthetic arsenical, called "carbarsone" for convenience. It is 4-carbamino-phenyl arsonic acid, and is supplied to us for experimental purposes by the Lilly Research Laboratories, Indianapolis. Carbarsone is absorbed on oral administration, and excreted in the urine. As with all arsenicals, it is contraindicated in renal and hepatic disease, and should be used cautiously until its action on the optic tract is determined. Animals killed by minimal single lethal doses may show symptoms of lethargy, loss of weight, abdominal distention, diarrhea, sluggish reflexes, failure of pupillary light reflex, and histologically some renal necrosis. Within the therapeutic range, no toxic symptoms and no tissue damage were seen in animals.

In human patients, carbarsone has thus far been very successful. It is given in doses of 0.250 gm. in capsule twice daily for 10 days, a total of 5.0 gm. in one course of treatment for the average adult. It has not been advised in the presence of recognizable renal or hepatic disease. No change of diet and no other drugs are employed. The patient continues about his ordinary business. In a small number of those treated, it has been necessary to repeat the course. If this is necessary, a clear minimal interval of ten days should be allowed between courses to allow complete elimination of the drug. Children have been given doses proportional to their body weight.

Results of treatment have been most encouraging. One hundred twenty-five unselected patients with amebiasis have been treated with a minimal follow-up of three months. Six of these required a second course. All of the series were free from *E. histolytica* for follow-up periods ranging from three to ten months.

After-treatment is sometimes necessary, due to the factor of a bowel mechanically damaged by amebic invasion and subject to secondary bacterial infection. Cure of amebiasis does not always mean cure of pathologic complication and sequelae. Here antiseptic irrigations, astringents, bland diet and belladonna have their use.

We are also investigating a halogenated oxyquinoline derivative, iodo-chlor-oxyquinoline. (vioform, N. N. R.) This gives promise of being a satisfactory and antiamebic agent.

CONCLUSIONS

1. Amebiasis is widely distributed in the United States, and is a serious infection which always should be treated, irrespective of symptoms.

2. Previous treatment has been unsatisfactory and sometimes dangerous.

3. A new synthetic arsenical, "carbarsone," has been used by us successfully. Success has been indicated by its freedom from toxicity when properly prepared, ease of oral administration, noninterference with usual activities of the patient, lack of need for accessory treatment, low cost and high curative index.

4. It is distinctly not our purpose to recommend special or any individual drugs. We do wish to indicate that it is possible to find better compounds than those now in use, and our present interest is in arsenicals and oxyquinolines.

350 Post Street.

TUMORS INCIDENT TO AND COMPLICATING PREGNANCY AND LABOR*

ALBERT MATHIEU, M.D., F.A.C.S.
AND
ALBERT HOLMAN, M.D.
PORTLAND, ORE.

The subject of tumors incident to and complicating pregnancy and labor was given such an interesting exposition by Dr. Frank Lynch at the 1931 meeting of California State Medical Society that we were stimulated to make a study of our own private records in this regard. We examined the case records of 2150 pregnant women and found 131 tumors of the pelvic organs in 115 women. The tumors were classified as follows: Miscellaneous tumors, cervical polyps, vaginal cysts, ovarian cysts and uterine fibroids.

MISCELLANEOUS TUMORS

There were ten cases in the miscellaneous tumor group. Two patients had rectal polyps; in one, the polyp was discovered in the sixth month of pregnancy with symptoms of local pain and bleeding. Under local anesthesia it was ligated and excised. The other was found six days postpartum presenting through the anus. It was four by six centimeters in size, deeply engorged and under gas anesthesia was ligated and excised. There was one patient who had a tubal pregnancy coincident with an unsuspected uterine pregnancy. The ectopic pregnancy was removed and there was an abortion of the uterine pregnancy five days later. One patient had a large psoas abscess pointing in the left lower quadrant of the abdomen, complicated by severe pulmonary tuberculosis. The patient was moribund when first seen. The baby's head was displaced by the abscess. The patient realized that she was dying and, having lost her first baby at birth, begged for a cesarian section to save her child. The cesarian section was performed, the baby saved and the mother died of inanition due to her tuberculosis on the third postoperative day.

Among the miscellaneous tumors are included cervical cysts. There were three cases of cysts of the cervix; two were approximately three centimeters in diameter and one at term had attained considerable size. The two small cysts appeared to be of no consequence. The large one, however, attained such a size as to fill the upper vagina and actually obliterated the external os from view. The details of this case are as follows:

Case 1. A primipara, age forty-three, was first seen when six months pregnant. Her cervix was found to contain a cyst. Her age precluded our interference with this cyst for fear we might induce a miscarriage. In the eighth month the cerevical cyst had increased in size so that it almost filled the upper vagina, and there was a large vein running across its surface. Neither by manual nor visual examination could a cervical opening be found.

Because of the cervical cyst, the apparent stenosis of the cervix, a large fetus in breech presentation and the age of the patient, a cesarian section was performed at term. When an attempt was made to remove the placenta, it was found to be growing into the myometrium and attempts to wipe it loose with gauze were of no avail. Considerable blood being lost in the attempt to separate the placenta, a rapid supravaginal hysterectomy was done and the patient left the table in severe shock.

Her postoperative convalescence was normal, following a blood transfusion. The baby weighed 4285 grams (nine and one-half pounds) and lived. The pathologic report on the uterine specimen was placenta accreta, an extremely rare condition. It is interesting to note that six months after the birth of the baby, the cervix appeared normal and there was no remaining sign of the cervical cyst.

This case is unique for the following reasons: Aged primipara, large baby, breech presentation, cervical cyst blocking off the upper vagina and obliterating the external os, and placenta accreta found at cesarian section. As far as we can ascertain this is the only reported case of placenta accreta found at cesarian section.

HEMATOMA OF THE VULVA

Included among the miscellaneous tumors is hematoma of the vulva. This is an extremely rare condition.

Case 2. One patient, who had marked varicosities of the labia two weeks before term, while straining at stool, ruptured one of the labial varicosities and a hematoma eight centimeters in diameter developed in the left labium majus. She was put to bed and cold compresses applied. She was delivered normally two weeks later. The hematoma was gradually absorbed.

Case 3. The second hematoma took place in a patient past forty years of age, having her third child. The birth was normal except that about two hours postpartum the nurse reported a great swelling on the left side of the vagina. A hematoma as large as a baby's head was found which involved the perineum, left labium majus, the left wall of the vagina and the contiguous tissue. Cold compresses were applied and the mass did not increase in size. By the tenth day infection had taken place and the mass had become converted into an abscess. This was incised, drained and healed rapidly.

These are the only hematomas of the vulva that we have seen in a combined experience of thirty-seven years.

An odd tumor included in the miscellaneous group is described in the following case history:

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* Read before the Fifty-seventh Annual Meeting of Oregon State Medical Society, Eugene, Ore., October 22-24, 1931.

Case 4. A twenty-one year old para-two was seen complaining of severe pain in her pelvis and lower abdomen. Examination revealed an enlarged retroverted uterus which we thought to be pregnant. On the right side and seemingly attached to the uterus was felt a hard mass. A diagnosis of a hard ovarian tumor complicating pregnancy was made.

At operation the vesical peritoneum, the omentum and a loop of ileum were found to be adherent to an organized blood clot on the anterior surface of the uterus near the right horn. The uterus was enlarged and pregnant. The clot was approximately four by nine centimeters in diameter, covered with a pseudomembrane. It was peeled from the uterus without difficulty and the patient made an uneventful recovery. Our only conjecture as to the source of the blood clot is that some one punctured the uterus in an attempted abortion. This the patient denies.

CERVICAL POLYPS

There were fifteen cases of cervical polyps found during pregnancy, one being associated with bilateral Bartholin cysts, and one with a fibroid tumor of the uterus. Six of the polyps caused bleeding and five of these were cauterized and caused no more symptoms.

In the sixth case the patient had been bleeding more or less for two months before we saw her in her fifth month of pregnancy. The polyp was cauterized and bleeding stopped for ten days. Then suddenly there was a renewal of the bleeding with uterine contractions and the patient miscarried. During her labor we found that she had a partial placenta previa. Just what effect the cautery had we can not state, but we do believe, if cervical polyps are causing bleeding, they should be carefully cauterized. The remaining nine cases of uterine polyps caused no symptoms, were of no consequence and were not treated.

VAGINAL CYSTS

There were twenty cases of vaginal cysts, four of them being of Bartholin glands and caused no trouble at labor. In two of these cases, however, the Bartholin cysts were removed during the performance of secondary perineorrhaphy in the third stage of labor. In two cases cysts were found in the subclitoral region, small and of no consequence. In six cases the cysts were high in the vaginal vault, small and of no consequence. In four cases the cysts were from four to six centimeters in diameter and high in the vaginal vault. In these four, under local anesthesia, the cysts were cauterized and evacuated, and the cyst lining destroyed by striping with the cautery knife. These were all on the right side of the vagina and were probably of Gartner duct origin. In four cases, small cysts were found in the lower portion of the vagina. All of these were in patients who had had episiotomies and were presumably inclusion cysts. These were excised in the third stage of labor.

OVARIAN CYSTS

In our studied cases there were twenty-one ovarian cysts, an incidence of one per cent. One, nine centimeters in diameter, was found at cesarian section and had nothing to do with the indications for the cesarian operation. In nine cases, large ovarian cysts were found which required operation. Five of these went on to normal delivery after operation, and four, one of which was complicated by a uterine fibroid, miscarried after the operation. Ten of the twenty-one went through pregnancy without operation and one, complicated by multiple fibroids, miscarried at four and one-half months. In this case, however, we felt that the miscarriage was caused by the presence of the fibroid tumors.

It will be noticed that in nine cases which required operation, four miscarried following the operation, a rather large percentage. On the other hand, there were nine of these cases in which operation was imperative because of the size or consistency of the tumor or because of a twisted pedicle. In these cases we feel that we did a great service to the mother and in five of the cases we feel that the operation saved the baby. One should be careful in giving a prognosis relative to abortion and miscarriage after the removal of an ovarian cyst complicating pregnancy.

The following are some of the interesting cases in the ovarian cyst group:

Case 5. A twenty-three year old primipara was first seen in the sixth week of pregnancy. The uterus was felt pressed against the symphysis by a large fluctuating mass which filled the pelvis. The diagnosis of ovarian cyst was made and at operation a week later, a multilocular dermoid cyst of the right ovary sixteen centimeters in diameter was found. The cyst was so large and so filled the pelvis as to actually have flattened the uterus against the symphysis. This cyst was removed and was found to be filled with hair and sebaceous fluid. The patient went through a normal pregnancy and labor.

Case 6. A twenty year old primipara was first seen when six weeks pregnant. A mass in the pelvis, eight centimeters in diameter, was found and diagnosed as an ovarian cyst. Operation revealed numerous adhesions with much of the pelvis filled by a dermoid of the right ovary. In freeing the adhesions about the cyst the corpus luteum in the other ovary was accidently ruptured and the yellow body was spilled. Miscarriage occurred four days after operation.

Case 7. A thirty-five year old quadripara was first seen when two months pregnant. Pelvic examination revealed an ovarian cyst approximately ten centimeters in diameter on the right side, crowding the uterus over to the left. She was sent back to the surgeon who referred her and a week later at operation an ovarian cyst was found and removed. We witnessed the operation which was carefully and expertly done, the uterus and pelvic organs being handled with extreme care. Notwithstanding this gentleness, abortion followed on the fourth day.

Case 8. A para-two, age twenty-five, was first seen in the sixth week of pregnancy with no abnormal findings. Near the end of her fourth month, she suddenly developed severe pain in her right lower abdomen with fever, nausea and vomiting. There was a marked leucocytosis and increase in polymorphonuclear cells in the blood.

Pelvic examination was negative and a diagnosis of acute appendicitis was made. At operation an ovarian cyst approximately fourteen centimeters in diameter was found with a severely twisted pedicle which included the fallopian tube. The tumor was high up in the abdomen almost under the liver. There was partial necrosis of the pedicle and a small portion of the uterine wall had to be excised with the tumor and pedicle. The patient had an uneventful recovery from the operation, went on to term and had a normal delivery of a normal baby.

Because an ovarian cyst may be a serious complication to pregnancy and labor, we feel that patients should be so individualized that operation will be performed when necessary. We are of the opinion that if the tumor is large, so that dystocia will result, if the cyst is apt to rupture, if there is danger of a twisted pedicle, if the cyst is low in the pelvis or if it is thought to be malignant or dermoid, operation is advisable and one should be guarded in giving a favorable prognosis regarding abortion.

FIBROIDS

There were in all sixty-five fibroids, an incidence of three per cent. Of these, there were six cases in which there were present other tumors such as ovarian cysts, cervical polyps or vaginal cysts.

While in most of the cases fibroids caused no trouble at all, there were a few which complicated the pregnancy or the delivery in a serious manner. There were eight cases in which cesarian section was required. Of these, one was complicated by a premature separation of the placenta; and in two, the multiplicity of the tumors so interfered with the mechanism of labor as to prevent dilatation of the cervix after many hours of hard labor and to require cesarian section. There were two cases in which cesarian section was done for some other indication and the fibroids were found at the operation. In only five cases were the tumors the prime indication for the cesarian section.

Of the cesarian sections done, two were of the Porro type, one because of multiple tumors and one because of the fact that the uterus would not contract and there was profuse hemorrhage. There was one death in the fibroid group, an embolic death ten days after a Porro section. In nine cases we attributed abortion to fibroids and in another case we felt that a premature separation of the placenta was caused by fibroids. Hence, abortion resulted in approximately fifteen per cent of the pregnant women who had uterine fibroids. The following cases are of interest in the fibroid group.

Case 9. One patient, a para-two, thirty-eight years old, was first seen when three and a half months pregnant. At this time multiple uterine fibroids were found. She was sent back to the surgeon who had referred her.

One week later at operation he found many small fibroids scattered about the uterine body with two large ones in the lower uterine segment. One subserous fibroid on the right side was removed by a myomectomy, but the one on the left lateral wall of the lower segment was so low in the pelvis as to preclude its removal without great danger of inducing a miscarriage and was not removed. By the end of the eighth month this fibroid had grown to be about twelve centimeters in diameter and interfered with engagement of the head. After complete dilatation the tumor was shoved manually out of the pelvis and the head was fitted into the pelvis and delivered by mid-forceps. Five months after delivery the tumor was found to be as large as before and hysterectomy was subsequently performed by the referring surgeon.

Case 10. A forty-two year old primipara was watched through an uneventful pregnancy and in the last months of pregnancy, several small fibroids, two to four centimeters in diameter, could be felt in the anterior surface of her uterus. She went into labor at term with pains occurring every two to three minutes but after thirty-six hours had no dilatation of her cervix.

Due to apparent cervical stenosis, a cesarian section was performed and at operation the entire uterus was found to be studded with small fibroids, the largest being three centimeters in diameter. Seventeen of these were counted at operation. No doubt the lack of dilatation in this case was due to faulty muscular action caused by the multiple fibroids. Three months later multiple small fibroids could still be felt on the uterus.

Fibroids of the pregnant uterus may be the cause of slow and prolonged labor. They may even interfere with the dilatation of the cervix. They may cause premature rupture of the membranes, hemorrhage, abortion or malposition. They grow rapidly in size and degeneration may take place. They do not often cause dystocia at the outlet. The general trend of treatment should, we feel, be conservative, although each patient must be considered individually. As Lynch[1] has said, "Myomectomy during pregnancy is a surgical curiosity and is most difficult to perform in the class of case in which interference is most frequently demanded—pelvic impaction." So often the complicating fibroid is impacted low in the pelvis and is intimately incorporated with the uterine wall. If myomectomy were to be performed in such a patient, the integrity of the uterine wall would be seriously disrupted and uterine rupture later in the pregnancy would be a real danger. Fifteen per cent of our pregnant patients with uterine fibroids aborted or miscarried.

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[1] Lynch, Frank: Pelvic Neoplasms. Gyn. and Obst. Monographs, New York, D. Appleton Co., 1931.

SUMMARY AND CONCLUSIONS

In a study of the case records of 2150 pregnant women, there were 131 tumors of the pelvic organs in 115 women. There were 10 miscellaneous tumors, 15 cervical polyps, 21 ovarian cysts, 20 vaginal cysts and 65 uterine fibroids.

The miscellaneous tumors as we classified them are of such infrequent occurrence and are so diverse in character that they should be treated according to the problem which they present, with the point always in mind of saving the life of the mother and baby. Because of their rarity, some of them offer a serious problem in diagnosis and treatment. Cervical polyps which are bleeding or which hang into the vagina should be removed with the cautery, otherwise they may be ignored.

We concur with Litzenberg[2] who says: "Ovarian cysts complicating pregnancy, labor or the puerperium occur less frequently than myomata of the uterus, but they are always dangerous. Unlike the myoma, the presence of a cyst is a distinct menace in itself. Therefore, with very rare exceptions it should be surgically removed as soon as discovered, whatever its size, location or type."

While the pregnant patient with uterine fibroids must be individualized, the tendency should be away from operation, because dystocia is not apt to occur, especially if the tumor is not in the pelvis. While the incidence of abortion, miscarriage, premature separation of the placenta, hemorrhage and uterine inertia is increased, too often operation will not accomplish the desired result. The very fibroid which will cause dystocia because of its position and impaction in the pelvis cannot be removed by myomectomy without disrupting either the pregnancy or the uterine integrity. For this reason the conservative treatment and the display of the best obstetric judgment in caring for patients with fibroids impacted in the pelvis or with multiple fibroids of the uterus preventing dilatation of the cervix lies in performing elective cesarian section at term.

545 Medical Arts Bldg.

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[2] Litzenberg, J. C.: Ovarian Cysts Complicating Pregnancy, Am. Jour. Surg. New Series III, 506, Nov., 1927.

THE TREATMENT OF VARICOSE VEINS AND VARICOSE ULCERS*

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The treatment of varicose veins and of kindred ulcers has been somewhat revolutionized. Until a few years ago the treatment of varicose veins, particularly in America, was surgical. The treatment by injection generally used at present is not altogether new. Pravaz (1851), inventor of the syringe which bears his name, treated aneurysms by injecting into them solutions of iron. The coagulation of blood brought about by this procedure brought forth the suggestion that solutions which caused coagulation of blood might be used in treatment of varicose veins. Desgranges and Vallette, contemporaries of Pravaz, used solutions of iron in the treatment of varicose veins. Chassaignac, using the same method, had several fatalities, the cause of which he thought to be septicemia. In 1854 Soquet introduced iodotannin and suggested its use in the treatment of large varicosities. Desgranges and Barrier treated sixteen patients with this substance with satisfactory results.

Because of this experience with a rather high mortality following injection of varicose ulcers, in 1876 perivenous injections were used, not only for the treatment of varicose veins, but also for hemorrhoids and rectal prolapse. The perivenous method was gradually discarded. Alcohol and phenol were used intravenously for the treatment of varicose veins. When these solutions were employed, the veins were ligated proximal to the site where the injection was to be made.

The surgical treatment of varicose veins has in many instances given satisfactory results, particularly if segments of veins were removed, as, for example, in the stripping operation. However, recurrence following surgical treatment has been estimated to be as high as 50 per cent. In 1911, Linser, treating patients for syphilis by means of intravenous injection of bichloride of mercury, observed that not infrequently thrombosis of the vessel occurred. This prompted him to suggest and use this substance in the treatment of varicose veins. In 1912 he discontinued its use because mild mercurial toxemia occurred in several cases. Genebrier, Sicard, Nobel and Kausch, contemporaries of Linser, used strong saline solutions in treatment of varicose veins, with excellent results.

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* From Division of Surgery, The Mayo Clinic.

* Read before the Fifty-seventh Annual Meeting of Oregon State Medical Society, Eugene, Ore., October 22-24, 1931.

In the last five years, many different solutions, such as salicylates, saline solution, bichloride of mercury, invert sugar, glucose, quinine dihydrochloride and urethane, have been used in the treatment of varicose veins.

EXPERIENCE AT THE MAYO CLINIC

Intravenous injection of sclerosing compounds has been employed at The Mayo Clinic in the treatment of varicose veins for several years, and has practically replaced the previous surgical type of treatment. Many thousands of injections have been made and many different types of solutions have been used. In the early experience of those of us who were carrying on this work at the clinic, as a safeguard against possible complications resulting from the injection treatment of varicose veins, the patient was required to remain in hospital for from twelve to twenty-four hours following each injection. After studying the effects of various solutions injected intravenously, we, as many others have done, arrived at the conclusion that the treatment could be applied to ambulatory patients. As a means of guarding against emboli, it has been suggested that the patient be placed in a recumbent position during the injection, and that a tourniquet be used. There seems, I think, to be some objection to this procedure. The application of a tourniquet causes engorgement of normal veins. If these are injected there is a possibility of emboli occurring because of the fairly active current of blood in such veins. In varicose veins the flow of blood is extremely sluggish, and in some instances it has been shown to be in the direction reverse of normal.

We have the patient stand until engorgement has made the varicose veins prominent. The injection is then made of veins either in the upper or lower portion of the extremity. It has been my practice to perform injection of the veins in the upper portion of the extremity first. I have no particular reason for doing this, except that I have felt that a greater region of chemical thrombosis occurs distal to the point of injection than occurs proximal to it. If my belief is correct, the phenomenon tends to show that the current of blood in varicose veins is extremely feeble. The amount of chemical thrombosis obtained from a single injection varies. In some instances a single injection of a sclerosing substance causes chemical thrombosis of several centimeters of the vein, whereas in others perhaps only 2 or 3 cm. will become so thrombosed.

Those substances used for injection of various veins with which I am familiar will for the most part cause necrosis and ulceration, if only a few drops of the solution are injected outside the vein.

There are certain contraindications to the injection treatment of varicose veins to which we have adhered rather rigidly. If patients who present themselves for treatment of varicose veins are found to have hypertension of marked degree, the wearing of bandages is advised instead of treatment by injection. I think, however, that in many such cases the treatment might be satisfactorily carried out. However, unfortunate experiences have been reported in cases of hypertension. In two instances, necropsy revealed that the cause of death was coronary sclerosis; emboli could not be demonstrated. Whether or not the substance injected was instrumental in precipitating the fatal attack of cardiac impairment, one cannot say. If death from any cause occurs soon after the injection of varicose veins, it is natural to blame the procedure as a contributing cause of death. An occasional case of embolus has been reported in which injection was made in the presence of existing or recent phlebitis. It is my opinion that in these cases the emboli have come from the existing phlebitis which most likely was of infectious origin. Another reason for not injecting varicose veins in the presence of phlebitis is that in certain of these cases the deep veins in the extremity may also be involved or may become involved. In pregnancy such solutions as quinine dihydrochloride are contraindicated. Usually we prefer deferring treatment of varicose veins which appear concurrently with pregnancy.

The important factor in cases of phlebitis is to determine whether the deep veins are involved. The Trendelenburg test is of great importance in making this determination. A simple and equally adequate test merely is to bandage the extremity tightly. If the patient does not complain of discomfort after two or three hours, it may be assumed that the deep veins are patent. It has been my observation that diffuse phlebitis involving the deep veins requires five or six years entirely to disappear, and that coexisting enlargement of superficial veins in such instances is a compensatory measure, and that the veins should not be molested.

Of the various solutions advocated for treatment of varicose veins, I prefer a solution of quinine and urethane. Glucose and invert sugar, in dilutions sufficient to produce thrombosis, are of such consistence that their administration may be

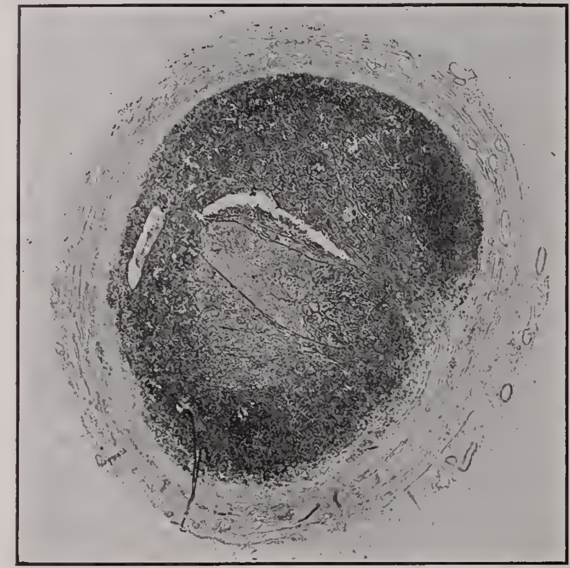
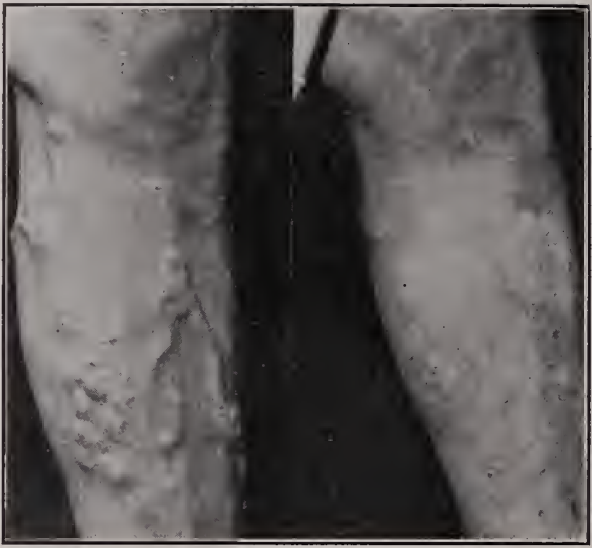


Fig. 1. Cross section of a vein obtained at necropsy of a subject who was killed in an accident twelve days after injection. The chemical thrombosis is complete; the thrombus is firmly fixed and can be readily distinguished from the usual type of thrombus which is accompanied by infection.



a b

Fig. 2. a. Large, tortuous veins on the lateral and anterior aspects of the leg before injection; b. the effect of two injections of sclerosing substances given intravenously. The photograph was made eleven days after the first injection.

difficult. I have used bichloride of mercury in several cases; it is, I think, efficacious. I discontinued its use because of a mild case of mercurial poisoning.

There is little mystery connected with the fact that emboli are negligible in this type of treatment, if careful study is made of the actual condition brought about in the vessel following injection with sclerosing substances. First, there is cloudy swelling in the endothelium. Following this, proliferation occurs. From these proliferated cells small fibers arise, forming a network, or screen, throughout the lumen of the vessel. In the network large blood cells are caught and a firm, fixed thrombus is produced in the absence of infection (fig. 1). This process ultimately results in the vein becoming a fibrosed cord. Sicard has found that hyalinization takes place within a chemically produced thrombus as early as five days after injection. The structure of a chemically produced thrombus, then, varies considerably from that of a thrombus occurring, for example, following some surgical procedure. In practically every instance of phlebitis in which thrombosis occurs, the thrombotic region presents definite evidence of infection. Following treatment by injection, so far as we have been able to determine, recurrence of varicose veins sufficient to cause distress to the patient is about 5 per cent.

The number of injections required in a given case is necessarily dependent on the extent of the varicosities and the amount of chemical thrombosis brought about by each injection. The average number of injections in a series of 400 cases was six. Figure 2 a shows rather large varicosities of the lower extremity. Two injections of 2 cc. each of dihydrochloride were given two days part. The photograph for figure 2 b was made eleven days following the last injection.

Inquiry should always be made, if compounds of quinine are to be used, whether the patient has an idiosyncrasy to the drug. If there is any such possibility, a small dose, 0.5 cc. should be used as the first treatment. Our method, following injection, is to bandage the region where the injection was made, and have the patient remain quiet for fifteen minutes, after which time no restrictions are placed on his activities. He is instructed to remove the dressing two days after the injection.

In our experience embolic phenomena have been absent. The injection method seems entirely to have replaced the previous surgical method, and because the patient can remain ambulatory during the treatment, it is of great economic importance to him.

In a fairly high percentage of cases which we see, the varicose veins are complicated by ulcer. Because of the intractability of varicose ulcer and possibly some apathy on the part of members of the medical profession, the majority of such ulcers are of many years' standing. Varicose ulcers occur more commonly in women than in men; the ratio is about 4 to 1. These ulcers may be classified in two groups.

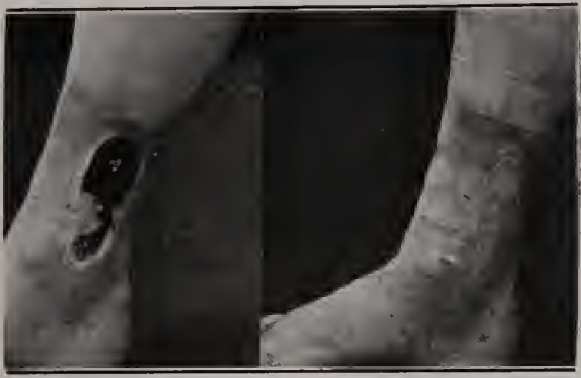

a b

Fig. 3. a. Huge varicose ulcers associated with a few visible varicose veins; b. the effect on ulcers following injection of associated veins, skin graft and bandaging. Four injections were made; the ulcer was completely healed in five weeks.

The first group comprises those cases in which there are huge tortuous veins which have permitted slowing, complete stoppage, or even reverse flow of blood. These phenomena cause improper oxygenation, as in arteriovenous fistula, with the result that ulcers form in many instances (fig. 3, a and b). Injection of the veins in the vicinity of the ulcer causes rapid healing, because the stagnant pool of poorly aerated blood is eliminated, and circulation through the capillaries is established. If the ulcers are large and markedly infected, we suggest bandaging for two or three weeks, using the elastic adhesive bandage, which may be applied directly over the ulcer in spiral fashion, beginning at the instep. Such bandages may be left in place for two or three weeks, after which time partial or complete healing will have taken place and the infection and edema will have definitely decreased. Injection of the veins may then be carried out with complete and permanent healing of the ulcer.

Cases of the second group (fig. 4, a and b) are much the same as the first, except that the tortuous veins are in the muscles, and therefore are not visible and in many instances not palpable. Obviously, treatment of the ulcer may be carried out by bandaging only. Occasionally, after the ulcer has healed and the bandage is discarded, premonitory symptoms or recurrence appear, such as eczema, cyanosis and edema. Bandages again should be resorted to, and subsequently at irregular intervals, as indicated. By directing attention to ulcers of the lower extremities which are associated with arteriovenous fistula, it may be seen why an adhesive bandage would be of value in treatment of varicose ulcers. In order that oxygen may be properly distributed to the extremities, the blood must pass through the capillaries before it reaches the venous system. In cases of arteriovenous fistula, the blood does not pass through the capillaries but is emptied directly from the artery into the vein. Consequently, ulcers which develop in connection with arteriovenous fistula of the lower extremities occur below the arteriovenous opening. If a tight bandage is applied in such a case, so that the vein at the point of fistula is compressed, and the blood is forced to pass through the capillaries, healing of the ulcer rapidly takes place; recurrence usually eventuates, if the bandage is discarded for any length of time.

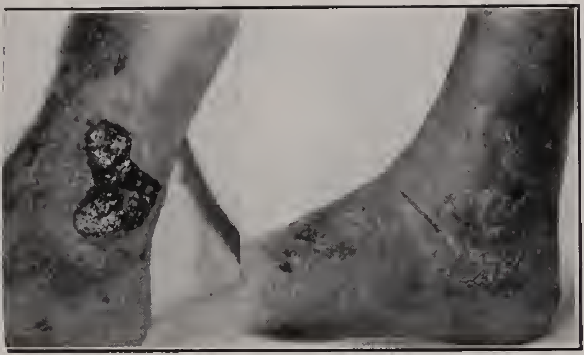

a b

Fig. 4. a. Ulcer in association with which no visible varicosities can be demonstrated; b. almost complete healing after wearing of an elastic adhesive bandage eight weeks without changing.

The use of casts of Unna's paste has been of much value in the treatment of varicose ulcer. Any bandage by which compression is exerted is of benefit in treatment of this condition. Adhesive plaster has been used with considerable success. The difficulty with bandages used heretofore is that they do not remain snug and adhesive plaster has not sufficient elasticity to afford comfort. The elastic adhesive bandage may be applied directly over the ulcer, or a piece of plain gauze may be placed over the ulcer before the bandage is applied. Usually it is not wise to change the bandage for three or four weeks, particularly if the ulcers are large, unless the patient experiences discomfort, and this is rare. However, a new bandage may be applied every week or two without hindrance to healing. If the leg is markedly swollen, the first bandage should be applied when the swelling is minimal; for example, in the morning discomfort may be experienced for an hour or two, after which comfort and freedom from symptoms are the rule. Several weeks may be required for complete healing of huge ulcers.

Skin graft, such as is indicated in figures 5 and 6, may be carried out in the office by means of local anesthesia. This, followed by immediate applica-

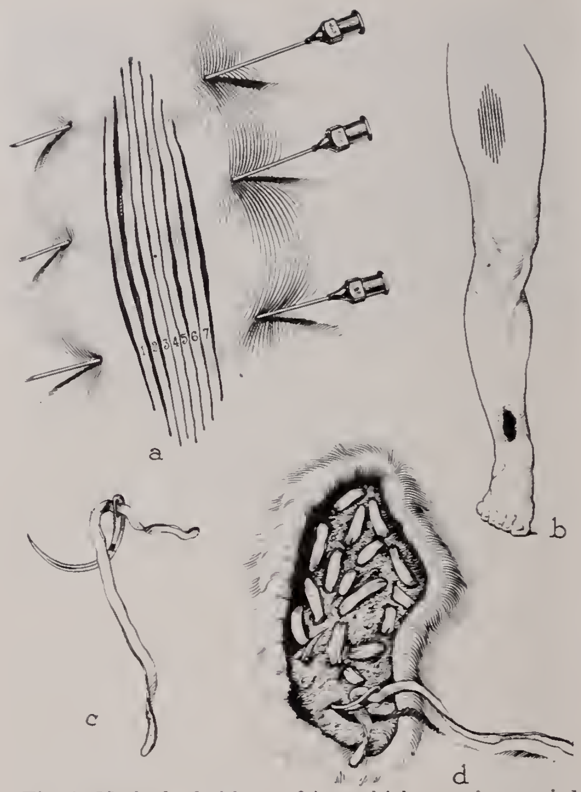


Fig. 5. Method of skin grafting which may be carried out in the office.

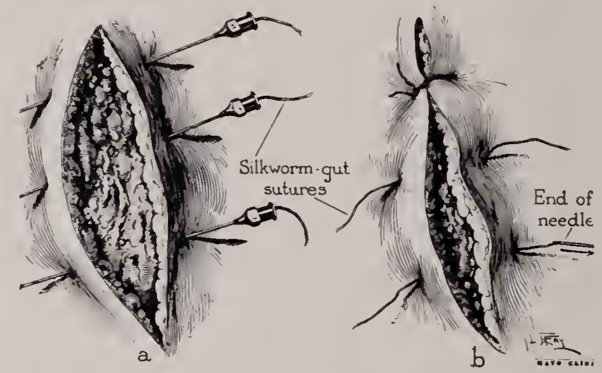


Fig. 6. Closure of superficial wound after skin for grafting has been removed.

tion of a bandage, has been considered valuable. The graft is applied as follows: Five or six small strips of skin, 1 to 2 mm. wide, and 10 to 12 cm. long, are taken from the thigh. By the aid of a fascia needle these threads of skin are sewed into the granulating ulcer surface in lattice fashion without care or caution as to position of the epithelial surface.

SUMMARY

There are various sclerosing solutions which may be used in treatment of varicose veins. Embolic phenomena, although not entirely absent following this type of treatment, are extremely rare and much less common than following surgical procedures. There are certain contraindications to injection of varicose veins, of which hypertension, marked arteriosclerosis, and existing or recent phlebitis are important. In cases of pregnancy, treatment of existing variocosities should be administered at least with caution. The elastic adhesive bandage has been of great aid to healing of these ulcers of the lower extremities which are secondary to varicose veins. The present method of treatment of varicose veins and kindred ulcers is not only effectual, but because the patient may be ambulatory is of economic importance.

THE PRE- AND POSTOPERATIVE MEDICAL MANAGEMENT IN CASES OF DIABETES MELLITUS

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The treatment of diabetes has so prolonged the life of individuals that the incidence of surgery among this class of patients has materially increased. The ability to control acidosis associated with anesthesia has so improved that, where the surgeon would not attempt major operative procedures, he is now quite willing to assume the risk. It is estimated by Joslin[1] that fifty per cent of all diabetics come to surgery some time or other during their course of illness. The surgeon does not in most instances burden himself with the details of metabolic management and, if his patient is to do well, there must be in the background a stable control of the metabolic processes.

PREOPERATIVE CARE

1. It is essential in the preoperative period in cases without coma that the patient be stabilized. In order to accomplish this, hospitalization should be required five to ten days prior to the surgical procedure.

2. During this period of management it is well to give a higher carbohydrate intake than one would, if he were stabilizing a patient without surgery as a consideration. With this in mind, two grams of carbohydrate per kilogram is not too much, or from 150 to 200 grams of carbohydrate. Sufficient insulin should be given with this program to obtain a negative urine and as low a blood sugar as is consistent. It is well in this period to keep the protein and fat intake low, protein at

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[1] Joslin, E. P.: Treatment of Diabetes Mellitus. Lea & Febiger. Philadelphia, 765, 1928.

not more than two-thirds gram per kilogram and fat at not more than one gram per kilogram.

3. This intake should be continued if the case is stabilizing adequately until just before the operation.

4. Drastic dehydrating cathartics should only be used with great care.

5. The customary use of morphine and hyoscine is acceptable.

OPERATIVE DAY

1. On the morning of the day of operation, 100 grams of carbohydrate may be given in the form of strained lemonade with cane sugar, two to three hours before the operative procedure. A liberal dose of insulin should be given with this liquid meal, let us say, from twenty-five to thirty-five units. The insulin given will not metabolize all of the sugar in the liquid meal and possibly there will be a slight excess spilling through, which is not a contraindication to the operative procedure. If a slight excess remains in the blood for use in the immediate postoperative period, its combustion under insulin dosage will help to keep one out of a ketosis.

2. After the patient has left the surgery several observations should be made:

a. As soon as possible examine the urine for acetone and sugar and continue to examine each voiding for the same until you have the metabolic process under the control of the carbohydrate intake and insulin dosage.

b. On the operative day give your patient as much carbohydrate as you were giving in the preoperative management. The one hundred grams given in the morning should be deducted from the total intake and the balance given following the operation. Try to give one-fourth of this balance every four hours. If oral feeding is practical, use up the carbohydrate in the form of cereal gruel, hot tea and sugar, fruit juice and sugar, or bread and jelly. Start this as soon as the patient can swallow. Cover the oral administration of the carbohydrate with the same amount of insulin as you allowed for it in the preoperative adjustment program. If oral feeding is not practical give sterile glucose intravenously. Five hundred cc. of ten per cent glucose would give 50 grams of carbohydrate. With 50 grams of carbohydrate give fifteen to twenty units of insulin to insure the combustion of the major part of it.

c. If the voidings show:

1. Sugar and acetone, give extra insulin. (Two units of insulin for each gram of sugar excreted,[2] not exceeding ten units.)
2. Sugar and no acetone, give extra insulin. (Two units of insulin for each gram of sugar excreted, not exceeding ten units, depending on the strength of the sugar reaction).
3. No sugar or acetone, be on the alert for an insulin reaction.
4. In case of insulin reaction, give orange juice (half glass) and sugar (two teaspoons), or adrenalin five minims (only if no glucose is available), or glucose intravenously (15-20 grams).

POSTOPERATIVE PERIOD

On the second postoperative day continue the same carbohydrate and insulin program as used prior to the operation. If the patient is in good condition and desires more nourishment than provided by the carbohydrate, half of the protein and fat intake may be added on this day.

Third postoperative day. As rapidly as one can, he should build the program up to what was proven a good balance in the preoperative period.

The preceding suggestions do not cover emergency procedures. In these instances one must guide oneself intuitively to get the situation in hand as best he can. Certain basic principles are to be kept in mind.

1. Never starve the diabetic patient. Maintain a glucose and insulin program if necessary by the intravenous route. Five hundred cc. of ten per cent glucose gives 50 grams of sugar. Twenty units of insulin will metabolize approximately 40 grams of sugar under favorable conditions.

2. Do not overload the stomach.

3. In cases of infection, where there is accumulation of pus, free drainage will always help the diabetic condition.

4. Until one has control of the metabolic phases of the situation, keep the proteins and fats at a minimum.

5. Where upper abdominal surgery has been undertaken, the management is a bit more difficult. Here one cannot feed by mouth so soon, and we must resort to the other means of getting carbohydrate and liquids into the body. The intrav-

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[2] McLean, D. W.: The Management of the Surgical Diabetic. Jour. Mich. State Medical Society. 30:434, June, 1931.

enous route is one sustaining means. Five hundred cc. of ten per cent glucose gives 50 grams of carbohydrate. Twenty units of insulin with this will insure the combustion of most of the glucose. The rectal route is much less satisfactory. One does not know how much carbohydrate is absorbed. The Murphy drip method may be employed for continuous administration of glucose and liquid, five to seven and one-half per cent solution. Gilchrist[3] suggests the use of small retention enemas, two hundred fifty cc., three to four times in twenty-four hours. By the third day food may usually be taken in small quantities by mouth.

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[3] Gilchrist, A. R.: The Care of the Surgical Diabetic. Edin. Med. Jour., 38: 30, January, 1931.

RENDERING DIABETICS INSULIN-FREE BY A SPECIAL METHOD OF FEEDING*

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Using this method of feeding, it has been possible in eight consecutive cases of diabetes in adults to give a full working diet and eventually to discard the use of insulin. All of these cases are recent, with duration of symptoms of from three weeks to four months before receiving medical attention. The initial starving blood sugars ran from 130 to 340 milligrams per 100 cc.

The patient is brought to the hospital, put to bed and placed on a basal diet, a basal metabolic rate determination being done in those cases evidencing thyroid difficulties. The usual starving blood sugar determination is done. The basal diet is given in the following manner *based on calories*. Two parts of carbohydrates to one of protein and one of fat. The basal diet is divided roughly into three equal parts for the three meals. Insulin is given in three equal doses at the usual interval before meals. It is gradually increased till the starving blood sugar is in the normal range and the twenty-four hour urine specimen is sugar-free. The patient is instructed in the usual manner to weigh her own food and do a daily Benedict's qualitative test on a twenty-four hour specimen of urine. At this point the patient is sent home and returns in one week for a check.

It will usually be found that the patient has had a slight trace of sugar on the second day after returning home, but that all tests since then have shown the urine free from sugar. At this time some will also report having had slight insulin shock at the end of the seven days. The diet is now increased usually by 80 calories of carbohydrates and 40 each of protein and fat. The patient appears in another week and usually reports that the twenty-four hour specimens have been free from sugar the whole time. The blood sugar will be found to be normal. A second increase in the diet is made at this time, in the same ratio and usually the same amount as before. This process is repeated until a full diet, allowing the patient to do full work, is given.

At this point the amounts of insulin are decreased, usually six units being cut from the daily dosage from once to twice a week. In these cases it has been found that on the second day after the reduction of insulin there is a trace of sugar in the twenty-four hour specimen and then none the following days. This reduction is kept up till the patient no longer uses insulin.

A word may now be necessary as to the duration of this insulin-free, sugar-free condition. As long as the patient keeps to substantially the same ratio in the diet and there is no infective process present, the condition seems to remain the same. In the presence of excessive sugar consumption or infective process sugar again appears in the urine along with all the other symptoms of acute diabetes. This is not a cure but is a method of treatment which will enable most of the recent adult diabetics to have a high carbohydrate diet and eventually discard the use of insulin.

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* Read before a meeting of Jackson County Medical Society, Ashland, Ore., Oct. 7, 1931.

POSTOPERATIVE USE OF THERAPEUTIC POOLS*

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When the Orthopedic Hospital, in Los Angeles, began to use the underwater exercises as a physiotherapeutic modality in 1924, our primary interest was fixed on the treatment of poliomyelitis. The effort was confined to chronic cases at first, but as a light epidemic brought us a few acute cases, we included them. Gradually, as we appreciated the value of the work in the water, we became braver, until we commenced this phase of treatment right after quarantine, as early as the end of the fourth week, even while pain, muscle neuritis and spasm existed.

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* Read before the Thirty-ninth Annual Meeting of Idaho State Medical Association, Boise, Ida., September 29-30, 1931.

We were impressed very early with the value of such treatments for other types of cases. We desired especially to get the operated poliomyelitis cases back onto water treatment and began to study ways and means of doing so. We noted, in handling polios in the acute stage, that the limitation of movement from pain and spasm was much less when attempted in the water. We concluded that earlier movement of operated parts would be possible without the production of joint pain and muscle spasm, and thus insure a much wider margin of safety when so handled. This proved to be true.

In spinal fusion cases for Pott's disease, scoliosis, fractures, etc., the back was held firmly in waterproof splints, the patient gently moved from bed to guerney, thence to the hydrogymnasium; lifted from the dressing room table, carried out to the pool and lowered into the water by the electric traveling hoist. Partly supported on a submerged, inclined plinth, the legs could be gently exercised, thus stimulating the general metabolism and raising the tone of the leg and pelvic muscles. It is especially important in such cases to improve the tone of abdominal, low back and gluteal groups. It can be done in this way without spinal movement and does not jeopardize the healing of the grafted area. Such treatment can be instituted by the eighth or ninth week. Otherwise it would be necessary to wait three or four weeks longer before very much physical therapy, other than massage to legs, or sun or light therapy, could be safely used.

Following the method of De Nuce, of Bordeaux, who uses walking in water after reduction of congenital dislocation of hips, we elaborated a similar follow-up for hips after operative, as well as closed reductions, beginning with the lying position on the plinth and later in free floating positions. The chief movements given are strong, active abduction and hip extension, with ankle and knee bending, but limited hip joint flexion. After two or three weeks of this, walking in shoulder depth water is begun. At first we use crutches, later discarding them, and the legs are used widely abducted in what we term the "straddle walk." About the same routine is followed for all joint and bone plastics, arthroplasties, shelf operations, bone grafts, hip and knee arthrodeses, etc.

The most trying time to the surgeon, of course, is from eight to ten weeks after operation, while bone repair, or regeneration, is taking place and the motions involved in walking, plus the danger of slips, falls or sudden application of muscle power to regain balance and prevent falling, are likely to undo what he has labored so hard to accomplish. This long period of inactivity, while waiting for wound healing, lessening of pain and spasm, and bone repair, naturally promotes not only atrophy, but circulatory stasis, both of which retard the process of healing. Thus, if this period can be shortened, recovery is hastened, hospitalization time reduced and expense lessened.

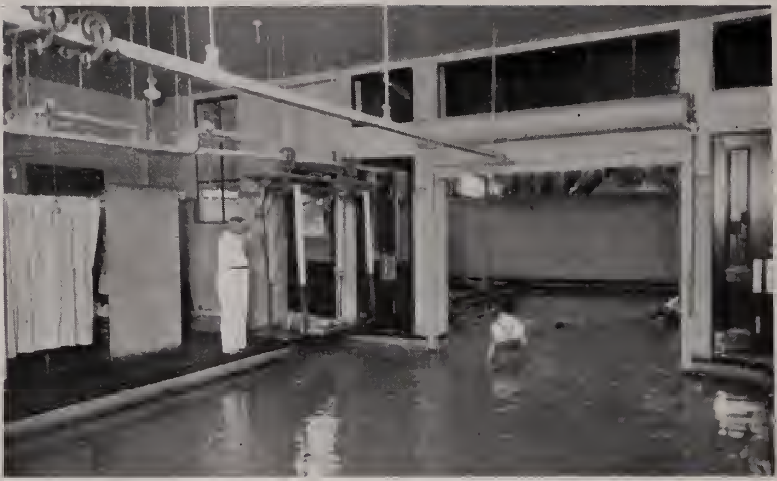
For instance, after a hip arthroplasty or shelf operation for congenital dislocation of hip, the patient, by the method mentioned above, may be placed in the water without bending or pain, the body floated to position on the plinth, and active movements of the part commenced. The only rules to observe are: (1) do not produce pain; (2) use only active motion of the affected joints within a painless arc.

Of course, in addition to this, movements of all other unaffected parts are stressed to begin with, because the patient's morale and general tone need building up after the shock of such large surgical procedures, and the long period in bed in splints or casts, awaiting the joyful day when he will have his turn in the pool. His chief fear is of pain in the operated area, so when the technician directs his attention to the exercises for the unaffected parts, this is overcome. The production of inhibitory spasm so common to all efforts of motion in bed does not occur, and he does not realize that during the movements of other parts quite a good deal of motion of short range takes place in the operated joint.

Next in sequence, are specific exercise for the foot and knee of the affected leg, which force blood and lymph to and fro through the operated region, from the muscle action below. Very definite, deliberate and forceful movements of foot, ankle and knee are given by the technician in order to force the patient to concentrate his attention on these parts, and keep it away from the hip. Thus the inhibitory reflex spasm so detrimental to physical therapeutic progress is avoided.

May I interject at this point, that improper handling of painful joints and muscles by strong, healthy surgeons, who have not the proper appreciation of joint pathology, many times accounts for failure, or at least delay of progress, due to the production of involuntary objection on the part of these sensitized structures. How often does the physical therapist labor for days to regain the confidence of a patient and build up his morale and assurance just to overcome the retardation, if not actual damage, produced by the ill advised, possibly vicious practice of some surgeon who does not know that passive motion has but little place in the treatment or handling of bone and joint cases.

We consider that by avoiding this spasm, and the earlier and safer attempts at active motion, such as we made in the water, we have succeeded in cutting down the convalescent period in the hospital at least fifteen to twenty-five per cent—or an average of perhaps two weeks. At an average cost of $6.00 daily for the hospital, if it is a charity case, or more than that in instances where a special nurse is employed for a private patient, the amount saved the hospital in a year may be considerable.



Indoor-outdoor therapeutic pools, Orthopedic Hospital, Los Angeles. Note electric traveling hoist for handling patients without bending and without pain, also submerged plinths on tables.

When spasm, however, does exist, or the adjacent joints are painful and partially stiff, as the knee for instance is in fractures of the femur, or from long incarceration in splints or casts, we have found that the compressed air bubbling massage applied to such parts aids very materially in lessening the spasm, and thereby aids the treatment possibilities, allowing a greater range of motion and improvement of the mental state. We use this means a great deal in the early stage of follow-up fracture treatment. It is especially suited to nervous children because of its sensory effect and its uniqueness.

Because of the absence of gravity load, due to buoyant support of the part by the water, tendon transplants can be activated with greater safety, through a somewhat greater range under water than is usually obtained in the bed or on the gymnasium table. The effect of this earlier activation guards against adhesions around the transplant and makes for better results in a shorter time. Where weight bearing is desired, but is rather dangerous (because there is no way of knowing exactly how much weight the patient really puts on the affected leg, even with crutches), this method affords a definite dosage, and is one of the most valuable parts of the treatment. This is effected by having the first standing and walking efforts made in water about four feet, six inches deep, which will average about to the axillae on most patients. At this depth, only about one-eighth to one-sixth of the body weight is actually transmitted to the sore joint, bone graft or fracture line in the leg.

Stepping in place, at first holding to the railing and then walking across the deep end of the pool with crutches, allows the legs to go through the complete joint range used in these movements, thereby reestablishing neuromuscular control, and stimulating all metabolic processes according to the law that function and structure are interdependent. As soon as it is safe and advisable, the patient moves up toward the shallower depths, thus cautiously increasing the weight dosage. At the same time, by the increase of joint range and muscle function, by other exercises on the plinth, or in free floating positions, greater physiologic response is gained. The fear of falling does not exist, but even so the patient is told not to worry, because if he loses his balance and falls over, no harm is likely to occur because there is no shock or strain to the part in the water.

In this connection, may I point out that the method which we instituted in our very first pool, of having the physical therapist in the water with the patient, is a great advantage, not only to give assistance and moral support, but to hold and guide the part during its exercises. This could not be done, were small or deep tanks used and she had to stand outside the tank and give instructions.

In cases with draining sinuses or open wounds, we use a saltpool, such as tuberculosis hip cases, Pott's disease, osteomyelitis or simply surgical wounds that are sluggish in skin closure, as we see so commonly in the wounds of poliomyelitis cases in certain regions, where the skin is thin and blood supply poor. This pool contains about 2100 gallons of water, into which 500 pounds of sea salt and two hundred pounds of magnesium sulphate are dissolved. This strength of brine does not tolerate germs, as it is a hypertonic solution, in which organisms cannot live long. Many cases of osteomyelitis that have become surgically clean, with the saucerized area filled with granulations, can be helped by mild exercising in the salt water. The patients are apt to be pale and thin from the long standing infection; they may have spent months in casts and have had repeated operations, and the respite and enjoyment of this type of treatment may help materially in building them up.

One of the most interesting cases, of more than usual interest as it is the first application of this modality that we ever heard of, is one of acute suppurative arthritis which Dr. Rolland, of our hospital staff, is reporting. A small Japanese boy of seven developed a large very acute knee abscess which was opened widely by two long incisions and the Willem's treatment instituted; that is, active passive movement several times a day through as large an arc as possible. This proved very painful, increasingly so, until my advice was asked and I suggested putting the child in the salt pool twice a day, and making the movements under water. From my personal experience I knew that the friction of joint motion, causing pain, is released in the water. We added the 200 pounds of magnesium sulphate to the water for this case and the child soon learned to make a fair degree of movement, which pumped this saline into and out of the joint, thereby cleansing it, while the motions prevented adhesions. The result, in six weeks, is a child with over 90 degrees of motion, which will probably increase as he gets older, instead of ankylosing, as is the usual result in such cases.

CONCLUSION

1. Underwater exercise promotes earlier return of function in operative bone and joint work than can be obtained by almost any other modality.

2. The physiologic use of parts affected, and the rest of the body, improves metabolism and hastens the healing process.

3. Movement without spasm and joint friction is possible through a large arc.

4. Motion and weight bearing can both be accurately scaled to dosage, either separately or together.

5. The morale of long-drawn chronic cases is greatly heightened.

6. Hospitalization time is shortened and economy results.

TUBERCULOUS INFECTION AMONG CHILDREN IN THE STATE OF WASHINGTON

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This report is based upon the results of the Mantoux tuberculin test performed upon a series of 430 children as part of the program of the Washington Tuberculosis Association.

In 1907, Von Pirquet,[1] by comparing the results of his tuberculin test with autopsy findings in 100 cases, demonstrated a high degree of correlation between tuberculosis and a positive tuberculin reaction. It has since been learned, however, that a positive reaction to tuberculin does not necessarily imply the existence of active tuberculosis. According to Krause,[2] an individual only becomes capable of reacting to tuberculin in the presence of anatomic tubercle. In this sense, therefore, a positive reaction to tuberculin implies only the existence of a tuberculous infection, nothing more.

The Mantoux or intracutaneous test was the method of choice of applying the tuberculin in these cases because it has been found more sensitive than the von Pirquet or epidermal test. Happ and Casparis[3] found a much higher percentage of positive reactors with the Mantoux test than with the von Pirquet. Austrian,[4] in studying a group of children over a period of years, found eight in each of whom a positive von Pirquet test eventually became negative. Afterwards, when the Mantoux test was performed in each, a slightly positive reaction occurred.

In performing the tests in this series, one injection had to suffice in each case. Inasmuch as the clinics were periodic in nature, it would have been impossible to have repeated the injection with a higher dilution at the time the reaction was read.

For the test, 1/10 cc. of a dilution of Old Tuberculin of 1/1000 was injected intradermally on the ventral surface of the forearm, after first cleansing it with alcohol. The site of the injection was then carefully examined in forty-eight hours for evidence of edema and redness. In reading the tests, the

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1. Pirquet, C. von: Der diagnostische Wert der Kutanen Tuberkulinreaktion bei der Tuberkulose des Kindesalters auf Grund von 100 Sektionen. Wien. Klin. Woch., 20: 1123-1128, 1907.

2. Krause, A. K.: Environment and Resistance in Tuberculosis. Williams and Wilkins, Baltimore, 82, 1923.

3. Happ, W. M. and Casparis, H. R.: The Value of the Intracutaneous Tuberculin Test in Extensive Tuberculosis. Am. Jour. Dis. Child. 23: 529-530, June, 1922.

4. Austrian, C. R.: The Evolution of Tuberculous Infection in Childhood. Am. Rev. Tuberc., 16:501-510, Oct., 1927.

method employed at the Henry Phipps Institute in Philadelphia, and described in "Childhood Type of Tuberculosis. Diagnostic Aids,"[5] was followed with slight modifications.

The extent of the central area of edema was the main criterion in classifying the results. Redness, while constantly present in varying degrees, was not regarded with as great significance as edema in grading the reactions.

A one plus reaction consisted of an area of edema of from 5 to 10 mm. in diameter; a two plus reaction had an area of edema 10 to 15 mm. across; while, in a three plus reaction, the area of edema was more than 15 mm. in diameter. In a four plus reaction there was extensive edema with some necrosis. The reaction was considered negative, if an area of redness but no edema was noted, or if only the mark made by the entrance of the needle into the epidermis was seen. The reaction was regarded as questionable, if there was slight edema less than 5 mm. in diameter.

Three hundred and twenty-one of these children had the test performed at the clinics held periodically in various parts of the state. All of this group were, by reason of contact or because of symptoms, considered as suspicious cases. These 321 children will be termed collectively a "white contact" group. Of the remaining 109 children, 74 were Indian and 35 were white. All of the 109 had the test performed in the schools, no effort being made to select a contact group only for study. Twenty-eight Indian and 10 white children from one school had the test. The remaining 46 Indian and 25 white children were from two different schools in the same town, one for Indian and the other for white children. It seemed practicable, therefore, to group all the Indian and white school children into two classes: an Indian and a "white control" group.

In Table I the results of the test in all the children are shown grouped into the three classes: questionable, positive and negative, with the total number and percentage of the whole in each respective group.

TABLE I

Classification of results of Mantoux testing in 430 children according to reaction groups, with number and percentage in each group.

Reaction group	No. in each Reaction group	Percentage in each Reaction group
Questionable	16	3.7
Positive	157	36.5
Negative	257	59.8
Total	430	100

From the results in Table I it will be apparent that the majority of the children reacted negatively to the test.

In Table II the results of the test in the 321 "white contact" children, the 35 "white control" school children and the 74 Indian school children are shown according to reaction groups.

TABLE II

Comparison of results of Mantoux testing according to reaction groups in "white contact" children, "white control" school children and Indian school children.

Reaction group	"White contact"	Per cent reactors	"White control"	Per cent reactors	Indian children	Per cent reactors
Questionable	5	1.5	6	17.1	5	6.8
Positive	120	37.4	5	14.3	32	43.2
Negative	196	61.1	24	68.6	37	50
Total	321	100	35	100	74	100

From the results, it will be seen that of the 321 "white contact" children, 120 or 37.4 per cent reacted positively; of the 35 "white control" children, 5 or 14.3 per cent were positive reactors; while of the 74 Indian children 32 or 43.2 per cent showed a positive reaction. These findings point to a fairly high percentage of positive reactions among the Indian children.

TABLE III

Comparison of ages of children in each of three groups receiving the Mantoux test. "White contact" children, "white control" children, and Indian children.

	NUMBER OF CHILDREN TESTED			
Age	"White contact"	"White control"	Indian	Total
1 or less	8	0	0	8
2	7	0	0	7
3	11	0	0	11
4	15	0	1	16
5	23	1	0	24
6	24	6	9	39
7	22	9	12	43
8	27	6	15	48
9	39	3	9	51
10	27	2	9	38
11	39	2	9	50
12	21	3	3	27
13	20	0	3	23
14	16	2	1	19
15	11	1	1	13
16	7	0	1	8
17	1	0	0	1
18	0	0	1	1
19	1	0	0	1
22	1	0	0	1
24	1	0	0	1
Total	321	35	74	430

From Table III it will be seen that the "white contact" children were considerably older, on the average, than the children of either of the other groups. The Indian children and the "white control" group, on the other hand, were roughly comparable as to age. Although there were more Indian children than "white control" children at ages 8, 9,

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[5] Opie, E. L., McPhedran, F. M., Aronson, J. D., and Chadwick, H. D.: Childhood Type of Tuberculosis. Diagnostic Aids. Nat. Tuberc. Ass'n., p. 22, 1931.

10 and 11 years respectively, the average age of the Indians was 9.05 years and of the "white control" group 8.6 years.

In Table IV the results of the tests in the whole group of 430 children are compiled so as to show the percentage of positive reactors at the various ages.

TABLE IV

Results of the Mantoux test in 430 children, showing number and percentage of positive reactors at various ages.

Age	Questionable	Positive	Negative	Total	Per cent Positive
1 or less	2	0	6	8	....
2	0	3	4	7	42.9
3	0	7	4	11	63.6
4	1	3	12	16	18.8
5	1	9	14	24	37.5
6	4	7	28	39	17.9
7	3	14	26	43	32.6
8	1	12	35	48	25.0
9	0	15	36	51	29.4
10	0	18	20	38	47.4
11	2	16	32	50	32.0
12	2	10	15	27	37.0
13	0	15	8	23	65.2
14	0	7	12	19	36.8
15	0	11	2	13	84.6
16	0	5	3	8	62.5
17	0	1	0	1	....
18	0	1	0	1	....
19	0	1	0	1	....
22	0	1	0	1	....
24	0	1	0	1	....
Total	16	157	257	430	

DISCUSSION

It was with considerable surprise that, upon compiling the results of the tests, the percentage of positive reactors among the Indian children was found to be less than 50 per cent. This surprise was no doubt occasioned by the fact that tuberculosis has often been considered well-nigh universal among the members of the Indian race. This finding of 43.2 per cent positive reactions among the Indian children is not in accord with Ferguson[6] who found 92.5 per cent positive reactions to tuberculin among the Indians of Saskatchewan.

It is interesting to compare the results of the tests among the Indian and among the "white contact" children. Forty-three and two-tenths per cent of the Indians reacted positively, while the figure for the "white contact" children was 37.4 per cent. The Indian group, therefore, presented some 5.8 per cent more positive reactors than did the "white contact" children. As mentioned previously, these white children were selected because of contact with a case of tuberculosis or because of suspicious symptoms. The Indian children were not so selected. Since the percentage of positive reactions among the unselected Indian children exceeds that among *selected* white children, the result points to a fairly high relative percentage among the former group.

From still another point of view the percentage of positive reactors among the Indian children will be seen to be higher than that among the "white contact" children. This is from the standpoint of comparative age of the two groups. Table III shows that the age of the "white contact" children, on the average, considerably exceeds that of the Indian children. Age appears to have an appreciable bearing upon the results of tuberculin tests. Hamburger and Monti,[7] and Hetherington, McPhedran, Landis and Opie,[8] found, in general, the older the children the higher the percentage of positive reactors. Slater,[9] and Matill and Fenger[10] were not able to corroborate these findings. Even though a deduction were made of ten per cent or more in the percentage of positive reactors among the "white contact" children, to offset the difference in age between the two groups, the result would merely serve to accentuate the higher percentage of positive reactors among the Indian children.

Again, comparing the percentage of positive reactors among the Indian and the "white control" children, the figure for the former group is seen to be relatively high. These percentages for each group are 43.2 per cent for the Indian and 14.3 per cent for the "white control" children. These two groups were similar in that the members of each were unselected because of contact. They were also roughly comparable as to age, as may be seen from Table III. The fact that more than three times as many Indian as "white control" children reacted positively to the test would point to a higher percentage of positive reactors among the Indians.

Since the tuberculin test is regarded as evidence of tuberculous infection, there can be only one explanation for the high percentage of positive reactors among the Indian children. It must indicate a high incidence of tuberculous infection in that particular group.

While the numbers tested are small, indeed, it is tempting to interpret these figures as suggesting that the Indians, in themselves, constitute a "contact" group, with an incidence of infection somewhat higher than the "white contact" children in this series.

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[6] Ferguson, R. G.: A Tuberculosis Survey of 1346 School Children in Saskatchewan. Canad. M. A. J., 12: 381-383, June, 1922.

[7] Hamburger, F. and Monti, R.: Die Tuberkuloseaufigkeit im Kindesalter. Muench. Med. Woch., 56:449-451, 1909.

[8] Hetherington, H. W., McPhedran. F. M., Landis, H. R. M., and Opie, E. L.: A Survey to determine the Prevalence of Tuberculous Infection in School Children. Am. Rev. Tuberc., 20: 421-510, Oct., 1929.

[9] Slater, S. A.: The Results of Pirquet Tuberculin Tests on 1654 Children in a Rural Community in Minnesota. Am. Rev. Tuberc., 10:299-305, Nov., 1924.

[10] Matill, P. M., Fenger, E. P., and Phelan, E.: Tuberculous Infection in School Children., Am. Rev. Tuberc., 21: 183-194, Feb., 1930.

Of course, there would be only one way of establishing this as a fact, and that would be to compare the results of tuberculin tests among an Indian group, such as the present series, with that among a group of known Indian contact children. This would, no doubt, be difficult, but it would be of interest in contributing to the solution of the problem of contact among Indian children.

The number of children tested in each age group is too small to permit any definite conclusion concerning the comparative percentage of positive reactors at the various ages. The results suggest the fact, however, that there is no proportionate increase in the number of positive reactors as the age increases.

CONCLUSIONS

1. Among 430 children given the Mantoux test there were 36.5 per cent positive reactors.

2. Forty-three and two-tenths per cent of 74 Indian children were found to react positively to the Mantoux test. This was smaller than first expected.

3. It is suggested by the results that the Indian children constitute a "contact" group with a higher incidence of tuberculous infection than "white contact" children.

4. The findings do not support the conclusion that there is a steady increase in the percentage of positive reactors to the Mantoux test as age increases.

PROCTOLOGIC PROBLEMS*

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THE PECTINATE LINE

The pectinate or anorectal line is the key to proctologic problems. A thorough knowledge of the embryology, anatomy and physiology under normal and faulty architecture is essential for diagnosis and treatment of anorectal diseases. It helps appreciate the many symptoms whether local or referred to adjacent or distant organs or inversely. Pain may be referred to the anus and rectum from other organs such as the bladder, uterus and ovaries. In other words, the anorectal margin is an area of greatest differentiation, specialization and rich with reflexes.

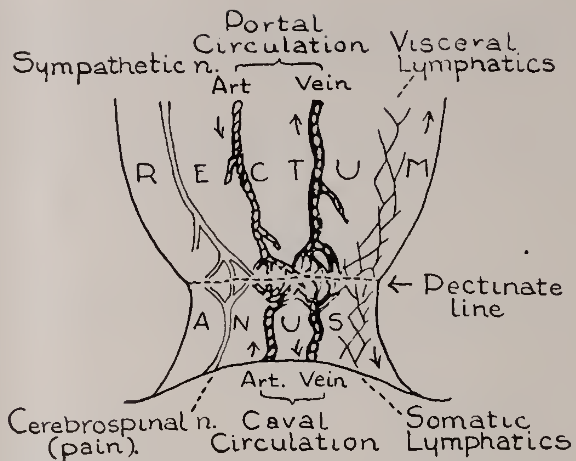

Fig. 1. Shows the anorectal or pectinate line (Pennington).

CROSS ROADS

1. "As the name implies, the anorectal line is the junction between the body wall and the viscera" (fig. 1). Columnar epithelium above, squamous cells below. Hence we expect pathologic lesions peculiar to the mucosa above and lesions of the skin below.

2. Visceral or sympathetic innervation above and cutaneous or sensory innervation below. For this reason even large lesions, such as ulcerations, cancer of the rectum and polyps, do not cause much distress, while a small lesion below this line causes agonizing pain, suffering and discomfort.

3. Portal circulation takes care of the circulation above the line and the inferior vena cava of the circulation below.

4. This area acts as a watershed of lymphatics. The lymph above the line drains into the sacral and lumbar, while the ones below drain into the inguinal glands.

5. The crypts of Morgagni give the dentate appearance to the anorectal line. They often act as catch basins of feces and bacteria. We find here the point of origin of most anorectal abscesses, ulcerations and fissures.

6. The planes of muscles and fasciae converge at this point, forming the splanchnosomatic funnel. Thus they receive traumatism from constipated stools (fig. 2).

7. Also the close contact with the anal sphincters is responsible for spastic condition of the anus with its many reflexes.

INSPECTION AND EXAMINATION

Much can be learned by visual inspection and digital examination. A patulous anus is due to relaxed or atonic sphincters, caused by (1) senility and chronic debilitating diseases; (2) tumor masses

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* Read before the Forty-second Annual Meeting of Washington State Medical Association, Aberdeen, Wash., August 3-5, 1931.

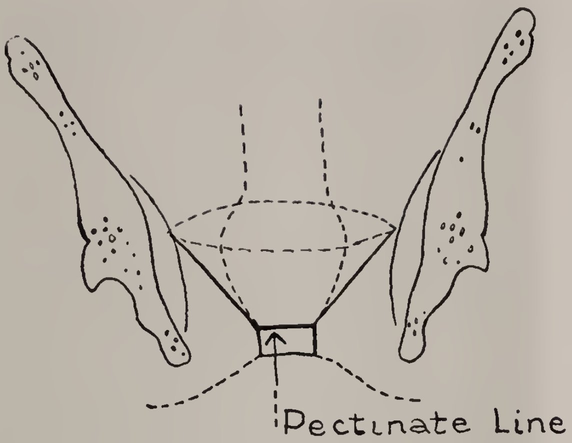

Fig. 2. The splanchnosomatic funnel (Pennington).

in or above the rectum such as cancer, polyps, hemorrhoidal prolapse, fecal impaction; (3) intussusception and stricture of the rectum; (4) lower chord lesions, a relaxed sphincter, one of the most definite and early signs of tabes dorsalis.

On the other hand, a tight and spastic anus is generally due to some irritating lesion below the anorectal line, such as anal ulcer or fissure.

PAIN

Most patients present themselves for relief of pain. These are either local or referred. Anal fissures, ulcerations, abscesses, new growths, strangulated internal hemorrhoids and thrombotic external hemorrhoids cause local pain. Often, in addition, pain is referred to the lumbar and sacral regions on one or both sides and along the sciatic nerve. Mummery of London calls attention to the not uncommon finding of a small ulcer in the anal canal as a cause of intractable sciatica. "The pudic nerve is derived from the same segment of the chord as the sciatic (Piersol) (fig. 3).

There is a very close relation of genitourinary disturbances and diseases of the anus and rectum. The pudic nerve with its perineal branches supply the prostate, the glans penis, transversus perinei, accelerator urinae and compressor urethrae on the one hand; on the other, it reenters the pelvis through the sacrosciatic foramen, crosses the ischionerve which supplies the skin around the anus and rectal fossa and gives off the inferior hemorrhoidal external sphincter (fig. 4).

It is easy to see why tenesmus of this sphincter may be accompanied with vesical tenesmus or symptoms of stricture of the urethra. "Pain may be referred to the rectum from adjacent organs, such as the uterus, tubes, ovaries, prostate, posterior urethra or trigone of the bladder. In these

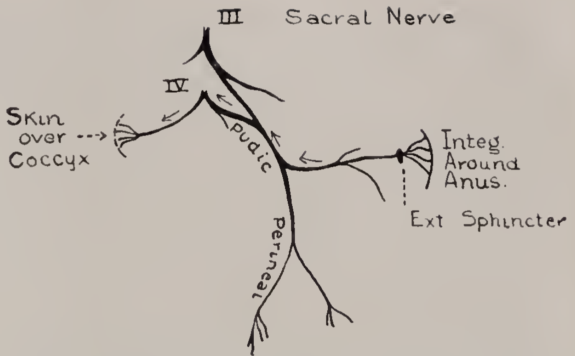

Fig. 3. Irritation at external sphincter referred to skin over coccyx (Behan).

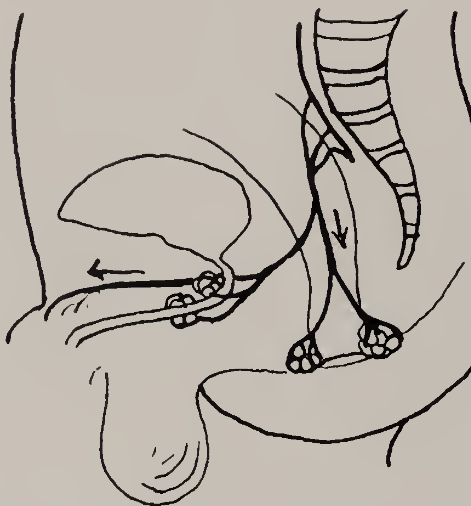

Fig. 4. Relationship of rectal to vesical tenesmus (Behan).

conditions the pain has more of an aching character, and there is a constant desire to go to stool" (Behan). Crockett reports a case who complained of a severe pain in the rectum which disappeared after removal of a bladder stone.

The pain of acute inflammatory diseases of the colon is of a burning, boring and griping nature.

CONCLUSION

In no other branch of surgery can one see such varied symptoms and likewise immediate relief can be obtained by the alleviation of the underlying cause. Today it is possible to treat anorectal diseases with confidence, handle the situation with deftness, preclude the results and make grateful friends, thanks to the accumulated scientific knowledge left us by pioneers such as Tuttle, Pennington, Bensaude, Martin, Matthews, Mummery and others. Their experiences are our inheritance.

To be acquainted with the pathologic conditions of anorectal diseases will materially aid in one's practice and bring happiness to a goodly number of patients. To be skeptical, aloof, neglect rectal examinations and to be indifferent to anorectal pathology will bring embarrassment, untold suffering and will indirectly contribute to the glorification of rectal quackery, whose existence today is largely due to the shortcomings of members of our profession.

We have all been told repeatedly that a thorough physical examination is not complete without digital examination of the anus and rectum, and may I add without exaggeration, that it is just as important and should be done as often as examination of the chest with the stethoscope.

CASE REPORTS

Case 1. A very intelligent woman, 32 years old, soon after an automobile accident developed marked distention of the abdomen. Complained of backache and occipital headache. Six months later she came to me because two prominent surgeons had diagnosed ovarian tumor and she was to be operated on within a few days. During the past six months she had been extremely nervous, suffering mainly from gaseous distention, headache and backache. The laboratory findings were essentially negative. Later, she told me that she was treated continuously during the six months' period for leucorrhea and dysmenorrhea.

The only sign that pointed to rectal trouble was that she had seen a little mucus and a few stains of blood soon after the accident and there was a fullness in the rectum.

Diagnosis: A postnatal ulcer and a submucous abscess.
Treatment: Divulsion and excision of ulcer and abscess.
Result: Cure.

Case 2. A man 45 years was treated for two months for stricture of posturethra. Treating the anal fissure, his urinary difficulty disappeared.

In any line of specialty our effort will be compensated, if we remember to make rectal examinations routinely. Occasionally, if the rectal pathology is not the underlying cause, we may find a lesion which may be aggravating the ailment or can be a mere coincidence.

Case 3. A woman had been in a hospital for several weeks for cerebral atrophy and lateral sclerosis. She had elaborate examinations and had gone through all kinds of roentgen-ray and laboratory procedures. Finally the neurologists requested a rectal examination.

We found a retrorectal abscess which was poorly draining into the rectum. About a pint of pus was removed. It is not the object of this paper to speculate on the relation of a focal infection and cerebral atrophy.

Case 4. A young man of 28 years, who had been treated for duodenal ulcer for a year without relief, felt well within forty-eight hours after treating his postanal infection and injection of one of his hemorrhoids. This patient has not had any gastric symptoms since eleven months ago and has not been under any dietary restriction.

Case 5. A man of 46 years had been treated for two years for general malaise, weakness and dizzy spells. From his charts I could make out that his teeth were extracted; then he was put under gallbladder diet and for the last three months was getting digitalis. He told me that all this time he was constipated and had bleeding piles. After a second injection of his hemorrhoids he has been for the last six months physically normal, and managing a truck corporation efficiently.

NEWER CONCEPTIONS REGARDING CHRONIC PARANASAL SINUS INFECTIONS *

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The conception of bacterial invasion of the mucosa lining the paranasal sinuses has been greatly modified quite recently. Animal experimentation[1] and clinical observation have provided facts which may justify a new classification of the etiology of paranasal sinus disease.

There are certain essentials which antedate bacterial invasion which can now be classified and studied separately. Reference is here made[2] to the definite derangements of the nasal sinus mucosa which as independent diseases prepare this membrane for bacterial invasion. It is evident[3] that the normal sinus lining inherently possesses sufficient immunity to protect itself from the everpresent flora of pathogenic bacteria and only when this mucosa has been deranged does bacterial invasion produce nasal accessory sinus infection. The causes of the derangements can be seen clinically very frequently before the bacterial infection has produced its symptoms.

In children, especially, we see a picture which is the forerunner of nasal sinus infection. Consider the pale, fretful child with failing nutrition who complains of tenderness in the legs coincident with spongy, swollen, purple gums; in other words, the early case of rickets who is referred for sinus examination. In the early stage there is no sinus involvement, but if a diet rich in vitamins is not prescribed at once, the nasal mucous membrane is soon in the proper state for bacterial invasion and a serious condition results. If, however, the proper diet is prescribed, the sinus infection is avoided or, if present, frequently subsides without other treatment. Of course, in the event of coincidently diseased adenoids or tonsils or an obstructing nasal deformity, this source of irritation must be removed, and in the cases which have already contracted a deep sinus mucosal infection, drainage and removal of hyperplastic tissue is required.

Proetz[4] of St. Louis has devised a nonsurgical

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* Read before the Annual Meeting of Eastern Oregon District Medical Society, Wallowa, Ore., Aug. 1, 1931.

[1] Shurly, B. R. and Turner, R. G.: Infection of Accessory Sinuses and Upper Respiratory Tract in Vitamin A Deficiency. J. A. M. A., 94:539-543, Feb. 22, 1930.

[2] Hurd, L. M.: Chronic Infections of the Nasal Accessory Sinuses. Ann. Otol., Rhin. and Laryng., 39: 966-973, Dec., 1930.

[3] Coffin, L. A.: Nose, Throat and Ear and Their Diseases. Jackson and Coates, 1929.

[4] Proetz, A. W.: The Sinus in Perspective. Ann. Otol., Rhin. and Laryng., 38:682-684, Sept., 1929.

method of treatment which has been well accepted. It is known as the displacement irrigation method of sinus diagnosis and treatment. His thesis won the Casselbury prize of five hundred dollars awarded by the American Laryngological Society at the 1931 meeting. In brief, the method consists in having the patient lie on his back with the head tilted backward as far as possible; then with the suction bulb in one nostril the fluid for treatment or diagnosis is instilled into the opposite nostril and the suction applied. In this manner some of the air is removed from the nasal sinuses and the liquid replaces it. When this method is used for diagnosis, an opaque oil is placed in the sinus and by roentgenography the drainage time, contents, size and shape of the sinuses can be determined. But in all events the proper treatment of the avitaminosis is essential for a lasting relief of the sinus condition.

There is another very common factor which is a predisposing cause of paranasal sinus disease. It is described as the "allergic state" and may be defined as a condition in which the mucous membrane, lining portions of the respiratory tract, is abnormally sensitive to certain protein substances whose presence produces a characteristic clinical picture. In seasonal hay-fever cases, seen early in their history and studied during the interval between attacks, we find little change in the nasal mucous membrane but, continuing this study during an attack, we find an edematous membrane of diminished resistance, well prepared for the reception of bacterial growth. This condition must be diagnosed early and the proper steps taken to eradicate the allergic state before the patient is the recipient of sinus infection.

In making the diagnosis of allergic disease of the paranasal sinus we must consider, besides hay-fever, vasomotor rhinitis and bronchial asthma.[5, 6] The nasal manifestations of these conditions are sneezing, nasal obstruction and nasal discharge. In hay-fever of the seasonal type these symptoms are easily recognized. In the nonseasonal type, in which the symptoms are intermittent, the condition is apt to be confused with "colds."

However, in allergy the nature of the discharge is of great help in the diagnosis. It varies from a thin serous liquid to a thick tenacious mucus and the microscopic examination shows the presence of eosinophiles. A careful history will also aid greatly in the diagnosis and sometimes reveal a positive family history or an important occupational or environmental factor. The dietetic history which must be taken in detail frequently yields the source of the offending protein.

The intranasal examination is distinctly characteristic. A moist grayish pink membrane with much edema is noted, more marked in the middle meatus and anterior ethmoid regions. In older cases polyps and hyperplastic tissue are present. Roentgenographic examination of the paranasal sinuses in this allergic state shows different degrees of opacity, depending on the amount of edema and hyperplasia and the presence of retained secretions. Lipiodal aids greatly in interpreting the change within the sinuses. Skin sensitization tests indicate the presence of the allergic state but it may exist with negative skin tests. It is a waste of energy to test the patient for substances with which he has no contact. Eosinophilia of the blood occurs in recent cases but not in old cases.

The treatment is both general and local. In the allergic state it is highly important to prevent vasomotor attacks early in life so as to avoid subsequent pathologic changes. The offending dust pollen or food must be removed from the environmet or, if more practical, the patient removed. Desensitization often is of value, especially for pollens, orris root (in face powder, etc.) and animal dander. It is surprising to note the relief which follows abstinence from tobacco. As to treatment with drugs, relief may be had with ephedrine, adrenalin, atropine, potassium iodide or cocaine. Surgical operations should be resorted to only to restore function or to eliminate infection. Removal of polypi and submucous resection are justified to restore nasal ventilation.

Another important predisposing cause of paranasal sinus infection is endocrine imbalance. In thyrotoxicosis the nasal mucous membrane loses its tone and presents an appearance similar to a mild allergic state. Hypothyroidism with its low basal metabolic rate is a condition which frequently precedes nasal sinus disease and, in cases where early treatment of calcium and thyroid extract (gr. ¼ t.i.d.) have been administered, a subsidence of the symptoms of sneezing, watery discharge and mental depression has been observed. In this condition of diminished resistance the membrane affords a fertile field for bacterial invasion.

It must be reiterated, when the infection is once established, it cannot be fully corrected without the correction of the underlying cause. The sinus

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[5] Bouvy, L. B.: Relation of Nasal Sinus Disease to Bronchial Asthma. Med. Sent., 37:569-573, Oct., 1929.

[6] Hansel, F. K.: The Diagnosis and Treatment of Allergic Disease of the Nose and Paranasal Sinuses. Trans. Am. Laryng., Rhin. and Otol. Soc., 403, 1930.

condition, of course, requires independent treatment, conservative or surgical depending on its pathology. While we are more familiar with the thyroid than other endocrine glands, there is no doubt that the pituitary and suprarenals when diseased give a nasal mucous membrane which can be the proper host for nasal sinus infection.

One other important factor to be considered is diminished systemic resistance, due to intercurrent infections and debilitating diseases. In the same group are to be considered cases with diseased tonsils, adenoids or nasal deformities which interfere with nasal drainage and ventilation. As the great majority of sinus infections which we see are well established, it is impossible to assign the exact predisposing cause to every case, but in most cases, especially in children,[8] the underlying cause can often be determined, and as previously mentioned, must be thoroughly considered in the treatment.

SUMMARY

Chronic paranasal sinus infection is not primarily due to bacteria but the final process is bacterial infection.

The primary derangement of the nasal and sinus mucous membrane is due to predisposing causes which may be classified as follows: (1) Deficiency in vitamines, (2) the allergic state, (3) endocrine imbalance, (4) diminished resistance due to intercurrent infections or debilitating diseases, (5) diseased tonsils and adenoids, and obstructing nasal deformities.

These conditions may exist independently or more than one can often be seen in the same patient. It is a natural deduction that these underlying causes must be treated before other treatment will be effective.

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[7] Novak, F. J.: Etiology, Pathology and Treatment of Hyperesthetic Rhinitis. Trans. Am. Acad. Ophthal. and Oto-Laryng., 239-246, 1927.

[8] Killian: Die Erkranhkungen der Nebenhöhlen der Nase bei Scharloch. Ztesch. f. Ohrenh., 56:189.

Circulation in Pyrexia. H. Ç. Bazett, Philadelphia (*Journal A. M. A.*, Oct. 31, 1931), points out that studies of the circulation in fever both in animals and man have been inadequate, and he expresses the hope that a more systematic study may be possible. For such studies the present methods of blood pressure measurement must be improved, and a greater capacity of analysis must be developed, since the respiratory methods of measuring circulation rate are unlikely to be adaptable to these cases. By improved tehchnic in measuring blood pressure, by a study of the character of the pulse wave, by consideration of the complexities introduced by end and lateral pressure heads, and by careful standardization of any calculations through comparison with circulation rate measurements of the respiratory type, it may ultimately prove possible to unravel the complexities of the circulatory changes in such patients by the use of relatively simple technical methods.

THE FRIEDMAN HORMONE TEST FOR PREGNANCY [*]

John Francis Fiorino, M.D.
EVERETT, WASH.

The early and accurate diagnosis of pregnancy by the ordinary physical and clinical signs is impossible. Our attention, then, must be turned to the laboratory. The laboratory diagnosis of pregnancy dates back to the earliest medical records. An Egyptian papyrus, 3,500 years old, reads as follows: "A woman may determine if she is pregnant by taking some earth and barley in a vessel and adding to it a little of her urine day by day. Should the barley grow, the woman is pregnant, but if the grain does not grow, then she will not bear a child." No improvement was made upon this early test until 1928.

The chemical analysis of blood serum for early pregnancy was first devised by Abderhalden and later modified by Luettge and von Mertz. The Abderhalden reaction was too impractical and inaccurate, so it soon fell into disuse. The same may be said of the antitrypsin test and the antithrombin test. The tests proposed by Bercovitz[1] and Manoiloff[2] have not been received with much enthusiasm. Ascheim and Zondek[3] in 1928 came forth with a biologic test for early pregnancy. They found an increase in the hormone of the anterior lobe of the hypophysis. Ascheim and Zondek[4] implanted part of the anterior lobe of the hypophysis into the thigh of an immature white mouse and three main morphologic changes occurred in the infantile ovary under the influence of the hypophyseal hormone. The immature mouse ovary contains only primordial follicles and small graafian follicles without cavities. The first change caused by the hypophyseal hormone is ovulation, i. e., the ripening and bursting of the graafian follicle and the discharge of the ovum into the tube. Second, there occur hemorrhages in the ruptured follicles which are visible to the naked eye as cyanotic dots. Finally, luteinization of the follicles occurs. The substance which makes changes in the ovary is present during pregnancy as Ascheim has found in the decidua, in the corpus luteum, in the placenta, and most important, in the urine of pregnant women. This excretion of the hypophyseal hormone in the urine of the pregnant woman forms the basis of the Ascheim-Zondek test for early pregnancy.

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[*] Read before a Meeting of Snohomish County Medical Society, Everett, Wash.. Oct. 6, 1931.

[1] Bercovitz Test Pupillary Reaction to Patient's Own Blood. Gordon, A. J., and Emmer, S. W.: Am. J. Obst. and Gyn. 21:723-724, May, 1931.

[2] Manoiloff, E.: Archiv. f. Gynak, 140:138. 1930.

[3] Ascheim, S., and Zondek, B.: Hypophysenvorderlappen and ovarium. Beziehunger der endokrinen Drusen Zur Ovarialfunktim. Archiv. f. Gynak, 130:1-45. 1927.

To perform the Ascheim-Zondek test it is essential to be in a position to command a ready supply of immature mice, weighing from six to eight grams. The test is performed by injecting urine from a suspected pregnant woman into five immature mice on two successive days, three times a day. One hundred hours after the first injection the mice are killed and the ovaries examined for corpora hemorrhagica and corpora lutea. Mathieu[5] has modified this method using only one immature rat for each test, injecting urine twice daily for three days, examining the animal ninety-six hours after the first injection. The Ascheim-Zondek test is fundamentally and essentially scientifically sound, but it has some distinct disadvantages, one of which may make it impractical in a laboratory or hospital not closely affiliated with some university or institute.

Friedman and Lapham[6] have used rabbits instead of white mice for the rapid procedure for the laboratory diagnosis of early pregnancy. Their method rests upon three fundamental facts.

First, the ovaries of an isolated, immature female rabbit contain neither corpora hemorrhagica nor corpora lutea, inasmuch as the rabbit does not ovulate spontaneously but only after coitus. Second, the urine of pregnant women contains some substance, or substances, which simulate in their biologic effects the anterior lobe of the hypophysis. Third, the ovary of the rabbit quickly responds to the injection of these substances by the formation of corpora hemorrhagica or corpora lutea.

The selection of rabbits is of the utmost importance. Mature, unmated female rabbits are used for the test. It is best to keep the females isolated, because it is possible that one doe may be "hopped" by another in heat and enter a period of pseudopregnancy. My rabbit dealer gladly cooperates in keeping the does separated from one another. The amount of urine injected varies with the different workers. Friedman injects 4 cc. of urine thrice daily for two days in the marginal ear vein. Forty-eight hours after the first injection the animal is killed and the ovaries are examined. Davis and Walker[7] use only one injection of 10 cc. of urine and autopsy the animal twenty-four to thirty-six hours later. I have been injecting 6 cc. of urine twice daily for two days, examining the ovaries thirty-six to forty-eight hours after the first injection.

Friedman[8] has demonstrated that a single intravenous injection of urine from a pregnant woman can provoke ovulation in a rabbit within twelve to fourteen hours. If a rapid diagnosis is desired, I inject three rabbits. One animal is sacrificed eighteen hours after the first injection. If the test is positive, the other two animals are saved until after ovulation is completed and used again. Alcoholic precipitation[9] of the active substances is now being done, so a more rapid test can be performed.

Three conditions other than pregnancy will give a positive Ascheim-Zondek test[10]. They are hydatidiform mole, chorionepithelioma and tumors of the testicle. There is no embryo in hydatidiform mole, so the living tissue of the mole is responsible for the positive reaction. One should make the test when there is a clinical suspicion of chorionepithelioma and always after a hydatidiform mole has been expelled.

To date, I have examined fifty-five urine samples by this method. Eighteen specimens were obtained from women in the latter months of pregnancy, and each gave a positive reaction. All of the cases presented themselves for a diagnosis at a time when an accurate clinical diagnosis was impossible. These cases have been followed to check the laboratory diagnosis either by the detection of fetal heart sounds or by the unimpeachable evidence of miscarriage. Careful control tests have been run. Negative reactions were obtained after injecting my own urine and that of women in whom it was definitely known that pregnancy at the time did not exist.

As far as I could ascertain with my results, the test has proven to be 100 per cent correct. It is likely that if I had more material, perhaps an error or two might have been encountered. The results from other workers are as follows: Schneider[11] in 100 cases reports 99 per cent accuracy; Eberson[12] in 175 cases, also Friedman and Lapham[6] in 111 cases and Magath[13] in 83 cases report 100 per cent accuracy. This laboratory test is even more accurate than the Wassermann test, which is only 94 per cent accurate.

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[5] Mathieu, A., and McKenzie, T.: North. Med. 30:55-62. Feb., 1931.

[6] Friedman, M., and Lapham, M.: Am. J. Obst. and Gyn., 31:405. 1931.

[7] Davis, M., and Walker, E. W.: New Eng. Jour. Med., 205:566-569. Sept. 17, 1931.

[8] Friedman, M.: Am. J. Physiol., 90:617. 1929.

[9] Zondek, B.: Klin. Wchnschr., 9:964. 1930.

[10] Ascheim, S.: Am. J. Obstet. and Gyn., 19:335-342. 1930.

[11] Schneider, P. F.: S. G. and O., 52:56-60. Jan., 1931.

[12] Eberson, F.: Proc. Soc. Exper. Bibl. and Med., 28:407-409. Jan., 1931.

[13] Magath, T. B.: Proc. Staff Meet. Mayo Clinic, 6:245. 1931.

A positive reaction appears approximately eighteen to twenty-one days following the intercourse responsible for the pregnancy. It becomes negative about four days postpartum. The test remains positive as long as living placental tissue is in biologic contact with maternal blood.

ILLUSTRATIVE CASES

Case 1. Mrs. R. H., age 25, missed her period on March 12, 1931. Five days overdue at first examination. No accurate diagnosis of pregnancy could be made by the usual physical and clinical signs.

First morning specimen of urine obtained and injected into a rabbit. Forty-eight hours later, ovaries examined and bulging corpora hemorrhagica and corpora lutea found. Fetal heart sounds are now present. Checks accurately with laboratory findings.

Case 2. Mrs. H. N., age 23, delivered in December, 1930. She is breast feeding her baby and has as yet not menstruated. In April she had morning sickness and says she felt like her first pregnancy. She was certain that she was pregnant.

Physical examination as usual at this early stage revealed nothing. Hormone test done and a negative reaction was obtained. She placed but very little credence in the test and continued to believe that she was pregnant, and I was inclined to believe her, because, at this time, I had but very little experience with the test. About three weeks later she called, informed me that she had begun to menstruate. The case was followed for four months and no sign of pregnancy was present. The test was correct.

Case 3. Mrs. L. F., age 46. Patient gave a history of irregular menstruation with an amenorrhea for two months. Previously, she was told that she had multiple fibromyomas of the body of the uterus.

It was decided to do a hormone test. A positive reaction resulted. She was told that she was pregnant and nothing could be done for the fibroids at this time. However, she was certain that she was not pregnant. At present, she is in the hospital awaiting to be confined. Without this test she may have had a hysterectomy. This test is invaluable for differential diagnosis.

Case 4. Mrs. H. B., age 23, gave a history of being two weeks overdue. She was seized with a sharp pain in her right lower abdominal quadrant, and began to flow. She fainted several times, and uterine bleeding with pain was still present.

A diagnosis of ruptured ectopic pregnancy was made. Before operation was decided upon, a hormone test was done. The test was negative. Her symptoms still were present and she was progressively becoming worse. The abdomen was opened and a marked tubal congestion with a hydrosalpinx was present. The test was correct.

CONCLUSIONS

1. The Friedman hormone test is a reliable biologic test for pregnancy.

2. The test is of value in the differential diagnosis of early pregnancy, of pelvic masses, ectopic pregnancy, hydatidiform mole and chorionepithelioma.

3. The results have been 100 per cent accurate.

4. The Friedman hormone test because of its accuracy and rapidity, has a definite place among those laboratory examinations which can be correlated with clinical data.

Quigley Clinic.

SPONTANEOUS RUPTURE OF HEART*

G. P. Winchell, M.D.
EUGENE, ORE.

H. S., age 63, laborer in the employ of the Eugene Woolen Mills Company.

First called June 15 about 10 a.m. Patient faint, pale, cold, clammy, conscious, nauseated. Complained of severe pain in epigastrium and up into the precordial region.

History. Usually well, never severely ill. Two years previously had a similar attack. Morphine was necessary to relieve pain at that time. In two days he had recovered and returned to work. On the morning of the day of present attack, patient had eaten heartily of sausage. This was believed to be the cause of his pain, nausea and looseness of the bowels.

Physical examination. This is a sturdy laborer, native of Bulgaria. Has worked for present employer for twenty years. Acutely ill. Skin pale and covered with cold sweat. Pupils equal, lungs clear, heart action weak but regular and steady. No heart murmur, no enlargement determined. Abdominal muscles moderately tensed. Severe pain localized under lower half of the sternum and upper abdomen. Pupils equal and responsive to light. Patient was conscious but complained of pain, faintness and weakness.

First aid treatmemt. Morphine ¼ gr., atrophine 1/150 gr. by hypodermic. This dose was repeated in half an hour as no relief was obtained by first hypodermic. Put to bed and heat applied. About 10:00 p.m. the patient again complained of severe pain and was again given morphine ¼ gr., and atropine 1/150 gr. He rested well through the night and the next day sat up an hour in the afternoon. He ate a moderate dinner, and retired early, feeling very well. About midnight he turned on his left side, reached over with his right hand and expired without a struggle.

Postmortem findings. The usual midline incision was made, the sternum removed and abdomen opened. Abdominal viscera were normal in color and position; the stomach wall was greately thickened and the mucous membrane congested. There was no sign of ulceration. There were many adhesions between a large, well filled gallbladder and adjacent structures. No gallstones were present. The gallbladder was easily stripped from its bed, spleen normal, appendix normal, kidneys showed quite marked degenerative changes.

In the chest the pericardium was seen to be moderately distended with fluid. When opened, this fluid was found to be blood, one large clot and the rest fluid blood. Along the lateral border of the left ventricle, about midway between the auricle and the apex, was a rupture wound about two inches long, of irregular outline, diagonally across the long axis of the heart. This rupture extended through the endocardium into the left ventricle, and was large enough to admit the finger easily.

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* Read before a meeting of Eugene Hospital and Clinic Staff, Eugene, Ore., Sept. 13, 1931.

PATHOLOGIST'S REPORT

Gross examination. The heart weighs 400 grams. All of the chambers are moderately enlarged, particularly the left ventricle. The myocardium of the right ventricle is of slightly increased thickness and invaded by fat. The endocardium is thin, smooth and shiny. There are no gross changes seen about the pulmonic or tricuspid valve leaflets. On the lateral and posterior surface of the left ventricle, there is a large defect in the myocardium and endocardium. This is a ragged rupture of the myocardium 4 cm. long. It extends obliquely across the longitudinal axis of the ventricle. The myocardium about the defect is discolored, purplish-red, mottled with gray. On the inner surface of the ventricle the defect is only 2 cm. long. Necrotic, purplish-red myocardium is present beneath the endocardium about the wound. There are no noteworthy gross changes seen about the mitral or aortic valve leaflets. The coronal sections of the coronary arteries reveal marked narrowing of the anterior interventricular branch of the left coronary artery by eccentric calcified plaques. At a point 1.5 cm. from its origin, this vessel is completely occluded by a reddish-gray firm clot. This is just proximal to the origin of the vessel to the ruptured area. The left circumflex coronary artery is thick-walled and narrowed but not occluded. The right coronary artery is dilated, tortuous and sclerotic. Its lumen is patent. When sectioned, the myocardium about the rupture is seen to be friable and of meaty red appearance.

Microscopic examination. Microscopic sections taken from the occluded area in the interventricular branch of the left coronary artery disclose marked distortion in the structures of the vessel. The walls are markedly and irregularly thickened, due to large calcified plaques involving both the intima and the media. The lumen of this vessel is markedly narrowed and filled with an adherent clot. This clot is made up of fibrin, leucocytes and red blood cells. These are arranged to show the line of Zahn. The clot is primarily adherent over a bulging area.

The sections of the myocardium, taken from the edge of the rupture, show marked destruction of the myocardial cells due to anemic necrosis. The myocardial cells are very indistinct and the nuclei present pycnosis, karyolysis and distorted polarity. The edges of the rupture present fragmented necrotic cells. There is considerable polymorphonuclear leucocytic infiltration, particularly at the periphery of the necrotic area. The stroma is more prominent than usual, due to edema. All of the small blood vessels are thick walled and tortuous.

Diagnosis. Marked coronary arteriosclerosis. Thrombosis of the anterior interventricular branch of the left coronary artery; anemic infarct of the myocardium; rupture of the left ventricle.

RARE CAUSES OF SPONTANEOUS RUPTURE OF HEART

1. Septic endocarditis, ulceration and perforation. (Case reported by Clayton, due to streptococcus viridans).
2. Embolism of coronary artery from endothelial vegetations.
3. Abscess of myocardium following general septic infection.
4. One case of hydated cyst of left auricle with rupture has been reported.
5. Tubercles and gummata.
6. Malignant tumors have been noted.

USUAL CAUSES

1. Coronary occlusion, with resultant infarction and degeneration of the muscle fibers of a small area, is the usual cause. The damaged area is unable to withstand the tensile pull of the muscle fibers or the pressure of the blood in the heart. So, primarily, the spontaneous rupture is dependent on a coronary occlusion. The occlusion may be due to a thrombosis, which in turn is the result of vegetations somewhere in the endothelial lining of the vascular system, usually the valves of the heart. This infection may be and usually is secondary in the heart, having its focus in the teeth, tonsils, gallbladder, the appendix or bowels, or the result of rheumatism, tuberculosis, syphilis or other infectious disease.

2. Arteriosclerosis, as in the present case, with gradual occlusion of the lumen of the coronaries with calcified plaques on the intima and final complete occlusion by formation of a clot attached to these plaques.

Spontaneous rupture is by no means a rare condition, yet it is seldom that one in general practice sees a case. This is the first one I have encountered in twenty-seven years' practice, or at least where a positive diagnosis has been made. Most cases are discovered in large clinics where many autopsies are performed. It is no doubt true that many a case of sudden death has been attributed to heart trouble, cerebral hemorrhage, angina, coronary occlusion, etc., when in reality it was the result of a rupture of the heart. In other words, diagnosis is impossible except by autopsy.

Historical. Spontaneous rupture of the heart has been known from very early times. The first recorded case is that of Harvey. Morgagni is known to have died of rupture of the heart. Early records are mostly reports of isolated cases. In 1925, Krumbhaer and Crowell assembled 654 cases and reviewed 22 of their own.[1] In 1928 a short report by Davenport listed 92 further cases, making a total of 746 cases up to 1928. The latest published report I have been able to find is that of Beresford and Earl[2] of the Tooting Bec Hospital. These authors list 46 cases diagnosed in their hospital since 1913. Taking it for granted that none of these cases had previously been reported, we have a total of 792 thus far reported.

An analysis of this number of cases makes it possible to draw certain conclusions as to the causes of spontaneous heart rupture, its frequency and distribution.

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[1] Krumbhaer, E. B. and Crowell, C.: Spontaneous Rupture of Heart. Am. J. M. Sc., 170: 828-856, Dec., 1925.

[2] Beresford, E. H. and Earl, C. J. C.: Spontaneous Cardiac Rupture. Quart, J. Med., 23:55-66, Oct., 1930.

Two possible immediate causes of rupture are to be considered: (1) the pull of the muscle fibers on contraction, (2) increased interventricular pressure.

Experimentally, it is found that the tensile pull of the contracting muscle fiber is much greater than the interventricular pressure (Beresford and Earl).

It is a surprising fact that very few cases so far published died after violent exertion. Death usually follows moderate exertion, the most common being the act of straining at defecation, or, as in the present case, merely turning over in bed.

MECHANISM OF DEATH

Death must follow rupture of the ventricle quickly, but may not be instantaneous. In some cases the loss of blood into the pericardium creates a negative pressure in the ventricle, allowing the auricle to invaginate into it. In the case herein described, a comparatively small amount of blood had been lost into the pericardium, which would indicate that the ventricle did not fill a second time after rupture. Death must have been instantaneous.

PREVENTIVE TREATMENT

Every case of angina pectoris or suspected coronary occlusion should be put to bed and prevented from making the slightest exertion. The patient should not be allowed to handle his water glass, feed himself, or even turn over in bed for a period of at least a month. It has been shown that the necrotic, infarcted areas become fibrous and able to withstand strain in from two to four weeks. If our patients can be controlled for that length of time, there is a possibility of prolonging life many months. It is well known that the heart muscle has wonderful powers of recuperation and the writer is convinced that adequate bed rest is not secured in most of our heart cases. This can be made possible by greater insistence on the part of the doctor and the gradual education of the public as to the necessity of such rest.

CONCLUSIONS

Spontaneous rupture of the heart is not as infrequent as supposed.

The principal cause is coronary occlusion with resultant necrosis of the anemic area.

Arteriosclerosis, thrombosis, endocarditis, syphilis, tuberculosis and rheumatism are the principal underlying factors.

Spontaneous rupture occurs during the period of life when arteriosclerosis is most common.

Treatment of suspected coronary occlusion should be more carefully supervised. Absolute bed rest should be insisted upon for at least a month.

ADDRESS

PROBLEMS BEFORE THE STATE SOCIETY*

Thomas E. Griffith, M.D.
THE DALLES, ORE.

Over half a century ago a group of gentlemen in Oregon, who followed the humane occupation of administering to the sick, realizing the necessity for the promotion of the science and art of medicine, and to properly safeguard the ethical standards of their profession, met and successfully organized the nucleus of our present State Society. This organization has grown steadily, achieving a standard of efficiency basically sound in order to meet the demands of an active, progressive profession, and has become a functioning unit of the American Medical Association.

With present day knowledge of the prevention, care and cure of disease, a new conception of the important relationship of medical service to society exists. Medicine has become one of the great economic factors in world economics. Many of the great achievements of the various sciences have been dependent upon our profession successfully performing or carrying its share of the burden. By reason of the importance of our position in the affairs of the world today, we have received an undue amount of attention accompanied by series of unjust criticisms, the attacks of which are threatening the social and economic structure of our organization.

During periods or times such as we are now experiencing, nearly every individual is speaking of the unfair division of wealth in our country and many of our citizens are in a mood receptive to the appeal of the various nostrums and remedies promulgated daily. One system in particular which, if more extensively inaugurated, will materially retard the scientific progress of medicine, deserves our immediate consideration, for it is being gradually forced upon us. I refer to paternal or state medicine.

Conceived in past decades by individuals interested in social service, misapplied philanthropically and sanctioned by many of the leaders of industry, it has, during this age of commercialism, attained added prominence through increasing publicity until it now assumes threatening proportions. In utter disregard of the humanitarian labors and philanthropic sacrifices daily made by members of our profession, we have been subjected to a barrage of accusations, resulting in countless investigations, the most important of which is that of "the high cost of medical care."

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* President's Address, read before the Fifty-seventh Annual Meeting of Oregon State Medical Society, Eugene, Ore., Oct. 22-24, 1931.

A more serious situation materially affecting the economic problems of physicians both individually and nationally is created when our government enters into active competition with the profession through politically powerful groups who are tapping our national treasury for funds, funds to which we as taxpayers have contributed! To meet the encroachment of paternalism as applied to medicine, and to develop plans for a proper defense, the unified efforts of all members of the Society, giving careful thought and deliberation without the modern tendency to haste, will be required. By keeping before the public the higher conceptions of the duties of our profession and the potency of our influence in determining the future health and happiness of our nation, and without departing from humanitarian principles and traditions, let us resort to a more complete and comprehensive program of education.

The Public Policy Committee, Public Health League, Woman's Auxiliary and the liaison professional groups may prove invaluable in assisting with this program. However, we must also have a spirit of fraternal cooperation to insure the solidarity required to successfully meet these many problems. To effect this cooperation the county units and sectional group units of our State Society must assume their share of the responsibility.

It is difficult to estimate the importance of a properly functioning county unit. Its meetings will promote a friendly intercourse among its members, conducive to the candid discussions of local problems which are ever present in different localities. Frank discussion of any matters of material interest to physicians, whether they embrace the problem of contract practice or constructive criticisms of the locally operating health center or unit, will tend to clarify many clouded and closeted subjects. I would especially recommend that the suggestion of the American Medical Association be followed in regard to the relationship which should exist between county units and social centers. In accordance with this plan, the activities of the social welfare bureaus carrying on health and medical service would be directed by the local medical societies, thus eliminating the extension of charitable service to individuals able to pay a reasonable fee.

The county units can render valuable assistance to the State Society in the field of politics. In the past, physicians have been extremely careful to remain aloof from any and all matters relating to politics. However, we are learning that to secure legislative enactments or amendments, we must interest ourselves and, through personal touch with our legislators or possible candidates, ascertain their views upon proposed legislation beneficial to the people of our state and to our profession.

Referring again to state medicine and its possible solution, in the immediate future various plans will no doubt be presented for the consideration of the profession. Whether these plans advocate the establishment of definite centers in allocated areas, where clinics will be conducted to render services and receive fees in accordance with the economic status of the individual, or whether the health insurance plan is presented, we should be prepared to meet the situation with fundamentally sound logical solutions.

In carrying on our educational and political programs, our profession should become more interested in the activities of the Woman's Auxiliary of the American Medical Association. Its members are ready and willing to assist or perform in an ethical manner any duties, social, philanthropic or educational, which the state or county medical societies request of them.

By minimizing our internal problems through friendly intercourse and group discussions, and by the proper interpretation of our ethical standards and obligations one to another, we will develop a spirit of collaboration and solidarity among our members which will enable us to render logical conclusions in the solution of our major problems.

TETANY ACCOMPANIED BY HYPERPYREXIA AND VOMITING IN FIRST DAYS OF LIFE: UNUSUAL SYNDROME. Murray H. Bass and Samuel Karelitz, New York (*Journal A. M. A.*, Nov. 7, 1931), report the cases of three infants who became extremely ill in the first days of life. They vomited frequently from the first day on; their abdomens became markedly distended; the temperature rose to a great height; two of them had marked dysphagia; they evidenced signs of great nerve irritability—Chvostek's sign was extremely marked; their extremities were held in carpopedal spasm; their cries were hoarse; they had repeated convulsions and seemed about to die. They were given calcium intravenously and hypodermically and promptly recovered. The authors are not prepared to state positively what caused these new-born infants to go into this hyperirritable state, but it is of interest to note that all three vomited profusely and in a projectile manner and had high fever and marked abdominal distention. This would allow one to suggest that the tetany may have been gastric in origin, secondary to the vomiting. Unfortunately, chemical studies were not made to substantiate this. The authors do not maintain that these are cases of infantile tetany but they do believe that, in spite of being newly born, the children were suffering from manifest tetany.

NORTHWEST MEDICINE
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Devoted to the Interests of the Medical Profession
of the Pacific Northwest

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DECEMBER, 1931

EDITORIAL

A TIMELY THOUGHT

The time was, in the earlier history of our profession, when the medical student and recent graduate learned the ideals, aims and practices of our ancient and venerable profession under the guidance and supervision of one who had become seasoned by experience. The lessons of age and experience as applied to the healing art were freely given to the understudy, and a personal responsibility was accepted for the successful launching of another doctor upon a mission of service to his fellow men. Many of these early relationships grew to life-long friendships, mutually helpful.

Today we live in another century. The modus operandi of medical education and initiation into medical practice has changed. Graduating classes are numbered by scores rather than tens. Responsibility has become divided, and medical graduates are too frequently poured into the profession en mass rather than welded into it by a sympathetic personal contact with its leaders. It is true, the medical faculty give of their knowledge and experience, but how many accept the challenge to give of themselves. How many will at times put aside the cloak of superior dignity and don the garment which gives access to the hopes, aspirations and ideals of the future doctor of medicine.

A kindly word, an hour of serious conversation upon matters pertaining to problems personal to the student, and a service has been rendered which only the future can adequately estimate. In such moments the desire to achieve is born, and the imagination fired by the hero worship to which we are all prone. Ambition is raised from the plane of dutifully following the beaten path to that of the will to succeed, and to such a one obstacles are mere stepping stones to greater things.

Where can and should such contacts be made? The senior year of the medical curriculum and the interne year offer innumerable opportunities for establishing this contact between the pioneers and leaders of our profession and those about to enter. Time and an unselfish desire to impart the ideals and aims necessary to professional leadership are essential. Medical schools in part have adopted the plan of having the senior student select an advisor from among the ranks of the faculty to aid him in such problems as may be begging attention. An even greater opportunity awaits the members of our hospital staffs to serve the interne who has only recently entered the profession, since hospital practice is only a stepping stone to the more intricate and professional problems of office and private practice.

A staff advisorship plan would help to "break the ice" and establish the mechanism, through which a closer contact might be established between the younger men of the profession and those successfully established in the practice of medicine. By this means we will carry over from the past into the present one of the most potent factors for welding into one united whole the young and the old, the inexperienced and the experienced for the common aim of all medical practice, i. e., the prevention and alleviation of human suffering from disease.

CONFERENCE OF SECRETARIES AND EDITORS

The Annual Conference of Secretaries and Editors of association journals was held in Chicago at headquarters of American Medical Association November 13-14. Representatives of nearly all the state associations and journals were present, as well as the trustees of the American Medical Association, with its president, past-president and president-elect. The Northwest associations were represented by Drs. C. H. Thomson, Seattle, and H. W. Stone of Boise, secretaries of Washington and Idaho associations, J. A. Pettit of Portland, American Medical Association trustee, and C. A. Smith, editor of NORTHWEST MEDICINE.

The programs for these meetings do not feature scientific papers. They are devoted to the reading of papers and discussions of medical economics pertaining to the different state medical organizations, conditions affecting medical practice, relations with the public and other allied topics. At this meeting particular attention was given to discussing hospitalization of veterans for nonservice disabilities, introduced by a paper by Dr. C. B. Wright of Minneapolis, "Medical and Hospital Service for Veterans." This plan of caring for veterans has been established by congressional action. The most desirable method for its development and future administration was the subject of much discussion. A procedure which met with universal

Edward L. Zimmerman, Eugene, Ore.
President, Oregon State Medical Society, 1932

Horace J. Whitacre, Tacoma, Wash.
President, Washington State Medical Association, 1932

Joseph N. Davis, Kimberly, Ida.
President, Idaho State Medical Association, 1932

favor will be soon presented at length. The menace of state medicine was depicted by a vivid report of a survey of this system as observed in European countries, particularly in Germany, by Dr. Sinai of Ann Arbor. Perusal of this paper will arouse thoughtful meditation on the part of anyone who reads it. It would be a calamity if medical practice in the United States were developed into conditions described therein. Practice of medicine by lay organizations was presented by Dr. C. B. Conklin of Washington, D. C. This form of practice has become established in some states on a large scale. It demands thoughtful consideration. Medical men in all parts of the country at the present time are much concerned about many economic problems which have aroused speculation and uncertainty as to the position of medical practice and its relation to the public for the years to come. The papers read at this meeting with ensuing discussions will be published in coming issues of the *Bulletin of the American Medical Association*. Some of them will receive particular attention in the state association journals in order that practitioners in all states may be assisted in reaching conclusions that will aid in future satisfactory practice of medicine.

THE JOURNAL OF THORACIC SURGERY

The multiplicity of specialists' societies in recent years and the attention paid to them by followers of these lines of practice has naturally resulted in the establishment of journals representing them. The American Association for Thoracic Surgery was organized in 1917 and has held national meetings during subsequent years. The papers presented at these gatherings have been published in established journals, but at the present time the officers of the association have determined there will be sufficient demand for a bimonthly journal to warrant its publication. Consequently the first issue of the

Journal of Thoracic Surgery appeared in October under the editorial management of Dr. Evarts A. Graham of St. Louis. It is announced that, while papers on surgery of the chest will comprise the bulk of publication, others will be presented dealing with various phases of thoracic diseases and problems of physicians, roentgenologists, bronchoscopists and others. The first volume contains an interesting number of papers, two on diaphragmatic hernia, being particularly attractive, by Harrington of the Mayo Clinic and by Eggers of New York. All practitioners concerned with thoracic surgery will find this journal especially attractive and helpful.

A LAMENTABLE TRAGEDY

The tragic death of Dr. Russell J. McCurdy is a striking illustration of the uncertainty of human life. Returning from a hunting expedition in Eastern Washington with three friends, under the guidance of an expert pilot, their airplane crashed into a mountain alongside the Snoqualmie Pass highway, bringing instant death to all. During his ten years of practice in Seattle he endeared himself to the medical profession by his personal character and qualifications as a physician. This was indicated by his election to the presidency of King County Medical Society, which office he held at the time of his death. Outstanding in his personal appearance, he possessed qualities of leadership which provide a useful asset for any citizen. He was beloved by a large circle of professional associates and a valuable clientele, all of whom deeply lament his sudden death when he was in perfect health and in the full vigor of early manhood. He will be treasured in the memories of his friends as a man of admirable personal qualities and an honor to the medical profession.

MEDICAL NOTES

The Western Branch Society of the American Urological Association held its seventh annual meeting at San Francisco, November 6-7. An exceptionally good program was provided and the attendance was above the average at all sessions.

The following officers were elected for the 1932 meeting, which will be held at Portland, Ore., July 1-2, 1932.

Dr. H. Welland Howard, Portland, President; Dr. A. W. Hunter, Vancouver, President-elect; Dr. F. S. Dillingham, Los Angeles, Secretary and Treasurer.

Executive committee: For 1 year term, Dr. Walter G. Schulte, Salt Lake City; for 2 year term, Dr. Wirt B. Dakin, Los Angeles; For 3 year term Dr. Miley B. Wesson, San Francisco.

Advertising for Physicians. Dr. Allen B. Kanavel, president of the American College of Surgeons, has recently expressed himself in favor of legitimate medical advertising to combat "charlatans and medical hijackers." He feels that it is worth considering by the legitimate profession as to whether times have not changed enough to make some modification of the rule against advertising advisable.

Ophthalmic Examinations. The American Board for Ophthalmic Examinations will hold an examination in New Orleans on Monday, May 9, 1932, at the time of the meeting of the American Medical Association. Necessary applications for this examination can be procured from the Secretary, Dr. William H. Wilder, 122 South Michigan Avenue, Chicago, and should be sent to him at least sixty days before the date of the examination.

OREGON

St. Helens Medical Society organization was completed at a meeting of St. Helens physicians Nov. 18. Dr. E. C. Dalton was elected temporary president and Dr. A. C. McCown temporary secretary. The organization will seek to promote goodwill among the doctors, to obtain a building where all local physicians may have offices, to take over and operate the St. Helens General hospital and to make it possible for workers in mills here to obtain the services of any physician they wish and be treated locally in case of accident.

Dedication Ceremonies for New Hospital. A huge crowd gathered Oct. 25 for the dedication ceremonies and open house of the new St. Mary's Hospital at Astoria. High officials in the church and of the medical profession spoke and complimented the hospital authorities on their new project. The financial cost of the hospital ran well over $300,000. The new addition is a four story structure, strictly modern in all respects.

Hospital Staff Elected. Dr. Toivo Forsstrom was elected president of the St. Mary's hospital staff at Astoria at its meeting Nov. 16. Other officers elected were A. G. Allen, vice-president and Arthur Van Dusen, Secretary; R. P. Pilkington, F. H. Vincil, Joseph McConnell and L. M. Spaulding members of the board.

Keep the Veterans at Home. Under the above caption there have appeared a number of editorials in Oregon papers, reflecting the attitude of the Oregon State Medical Society between hospitalization of veterans in their home communities wherever possible and shipping of them to distant government stations for treatment. The action calls attention to a situation which is felt to be unfair to all concerned and always uneconomical.

Corner Stone Laid for Hospital. The new $50.000 McMinnville hospital was dedicated and the corner stone laid Monday Nov. 9. This will be a community hospital open to all licensed physicians.

Dr. G. E. Low will again engage in the practice of medicine and surgery at Grants Pass. For the past fifteen months he has been away from the city and has been engaged in the timber business in Mexico.

Hospital Saves Money. It is refreshing to read that the Eastern Oregon State Hospital at Pendleton will return to the state at the close of the current biennium approximately $116,000, according to a report of Dr. W. D.

McNary, superintendent. The saving is said to have been possible because of the economies instituted by the administration.

License Case Up for Trial. Harmey R. Dewey of Portland went on trial recently on a charge of practicing medicine without a license. He was indicted in February, 1931.

WASHINGTON

Investigator's Report on Harborview Hospital. Drs. W. T. Woolley and Arthur Crookall, in a report on their recent investigation of the conduct of the new Harborview Hospital in Seattle, made the following suggestions: First, they recommended the name be shortened to "King County Hospital" to discourage patients financially able to go to a private hospital. Second, they commend the nonsalaried board of trustees for their interest in and work on behalf of the hospital. Third, they urge patience on the part of the press and citizens while the hospital operation is in its experimental stage. Fourth, they commended the treatment accorded the patients and found without foundation twenty specific reports that patients had been neglected. Fifth, they branded as without foundation the rumor that patients not entitled to charity were being admitted to hospital. Sixth, they described the instiution as of the highest type, both as to equipment and building.

Plans for New Hospital Under Way. A new Norwegian hospital to replace the present institution on Woodland Park Avenue in Seattle has been announced by the chairman of the Norwegian Hospital Association. The new structure is to cost approximately $250,000.

Shrine Hospital for Spokane. A seventy thousand dollar hospital for crippled children was assured for Spokane with the recent announcement from the chairman of the Shrine hospital committee that bids for construction would be opened within the next few weeks.

Walla Walla Medical Society met at the Marcus Whitman Hotel in Walla Walla Nov. 13. P. G. Flothow of Seattle read a paper on "Diagnostic and Therapeutic Injections of the Sympathetic Nervous System." C. S. Leede also read a paper entitled "Asthenic Patients. A Suggestion for Treatment."

Yakima County Medical Society held its meeting at the home of Dr. W. A. Taylor in Ellensburg Saturday, Nov. 7. Following a dinner, the group listened to papers read by A. B. Hepler and J. T. Mason, Seattle. The meeting was presided over by Kay England and was concluded by a talk by H. J. Whitacre, president of the state medical association.

New President for Medical Society. Owing to the death of Dr. Russell J. McCurdy in an airplane crash recently, Dr. Frederick Slyfield, president-elect, automatically assumed the presidency of King County Medical Society.

Seattle Physician Honored in Vienna. Dr. Joseph Segal of Seattle was elected vice-president of the American Medical Association of Vienna at their last election. The doctor is taking a six months' course in Vienna clinics.

New Physician for Entiat. Dr. E. D. Maxon, formerly of Walworth, Wis., has recently opened an office for the practice of medicine in Entiat. He is a graduate of Loyola University Medical School of Chicago.

Dr. Merlin E. Mullinex and associates announce the opening of a $12,000 medical and surgical clinic in Yakima on North Eleventh Street.

Dr. R. E. Staley, formerly of Seattle, will locate in Enumclaw to practice his profession. He is a graduate of the University of Nebraska Medical School.

IDAHO

Construction of Veterans' Hospital Begins. Actual construction of Boise's new $229,000 veterans' hospital started the first of November. It will be a four story stone building with a capacity of 148 beds.

Dr. Minnie Howard, retired physician of Pocatello, has been appointed historian of Bannock county by the Idaho Historical Society.

Dr. H. J. Sturgis of Coeur d'Alene has recently purchased the controling interest in the Lakeside hospital from Dr. E. L. Spohn. The Coeur d'Alene hospital has been a partnership venture of the two men for some time. Dr. Melvin Drake will take up offices in the hospital.

Banner County Medical Society held a meeting last month, at which the following officers were elected for the ensuing year: President, R. I. Ross, Sandpoint; Secretary-Treasurer, F. B. Evans, Sandpoint; Censor, C. P. Stackhouse, Sandpoint; Chairmen, E. E. Fry, Bonners Ferry, and L. J. Stauffer, Priest River.

OBITUARIES

Dr. Russell J. McCurdy of Seattle, Wash., died in an airplane crash at Snoqualmie Pass November 1, aged 38 years. He was born at Lansing, Mich., in 1893. During his youth he lived in Seattle, where he attended high school. He graduated from Michigan Agricultural College and then obtained his medical degree from Northwestern University Medical School in 1918. He entered the Navy the same year, serving for two years. He located for practice in Seattle in 1920. In 1930 he was elected president of King County Medical Society, which office he held at the time of his death. He was held in high esteem by the medical profession and the public.

Dr. Thomas Carr Avary, aged 72, assistant city health officer at Portland, died October 25 at Good Samaritan hospital in that city. He had been ill for four days with pneumonia. He was born in Decator, Georgia, and was a graduate of the Southern Medical College at Atlanta, Ga., in 1889. He came to Stevenson, Wash., in 1902 and operated a sanatorium there until 1925, when he went to Portland as a member of the city health department, which office he still held at the time of his death.

Dr. Frank T. Wilt, aged 50 years, died in the Swedish Hospital, Seattle, Wash., Nov. 16, when he failed to rally from an operation. He was born at Cascade Falls, Ore. He graduated from the University of Washington in 1905 and obtained his medical degree at Stanford University Medical School, San Francisco, in 1909. For several years he was assistant superintendent at Western Washington State Hospital. He was chief neurosychiatrist at Base Hospital No. 50 in France in 1917-18. On his return he served as neuropsychiatrist for the Eagleson clinic in Seattle for seven years. He was also consulting neuropsychiatrist for the United States Federal Board.

Dr. Elmer E. Langley, aged 50 years, formerly flight surgeon at Felts Field, died at his home in Los Angeles, Calif., Nov. 12. It was thought that a heart attack was the cause of death. He was a graduate of Baltimore Medical College in 1905. He had practiced in Spokane for fifteen years, before leaving for California two years ago, as an eye, ear, nose and throat specialist. He became flight surgeon in 1925 and served in that capacity for four years.

Dr. Robert W. Bell, Jr., of Walla Walla, Wash., died Nov. 14, aged 61 years, at the United States Veterans' Hospital at Walla Walla. He was a graduate of Albany Medical College, and for a number of years had been on the medical staff of Veterans' Hospital No. 85. The cause of death was a sudden heart attack. The body was shipped to Washington, D. C., for burial in Arlington Cemetery.

REPORTS OF SOCIETY MEETINGS

OREGON

POLK-YAMHILL-MARION COUNTIES SOCIETY

Pres., R. L. Wood; Secty., W. W. Baum

Polk-Yamhill-Marion Counties Society held its regular meeting at Salem, Nov. 3.

Dr. W. B. Morse of Salem read a colorful paper on his experiences in the practice of medicine and surgery during the last forty years. Dr. Arthur Jones of Portland read a paper on "Physiology and Application of Infrared Energy."

Dr. Louis J. Wolf, previous state health officer and surgeon with Admiral Peary on one of his polar expeditions, has been appointed assistant city health officer of Portland to fill the vacancy created by the death of Dr. Thomas C. Avary.

A meeting of Polk-Yamhill-Marion Counties Society was held at Salem, November 10.

J. Morris Stemmons of Los Angeles, formerly assistant professor of obstetrics at medical schools of The Johns Hopkins University and Yale University, presented a paper on, "The Induction of Labor at Time."

Oregon Cancer Survey. Under the auspices of Portland City and County Medical Society and Oregon State Medical Society, Dr. John M. Flude of Los Angeles, field representative of the American Society for the Control of Cancer, is conducting a survey of hospitals and medical facilities in Oregon for the diagnosis and treatment of cancer.

PORTLAND CITY AND COUNTY MEDICAL SOCIETY

Pres., N. W. Jones; Secty., H. P. Rush

A regular meeting of Portland City and County Medical Society was held November 4.

A paper was presented by D. C. Burkes on "Scope of Psychiatry." H. H. Dixon read a paper on "Relations of Psychiatry to General Medical Disorders."

A meeting of the society was held November 18 in connection with Portland Academy of Medicine.

Dr. Albert Kuntz, Professor of Anatomy, St. Louis University, presented a paper on, "The General Anatomy and Physiology of the Anatomic System and Its Relation to Various Diseases, Particularly Those in Which Surgical Intervention Has Been Applied."

UNION COUNTY MEDICAL SOCIETY

Pres., W. K. Ross; Secty., Lena Wilkies

Union County Medical Society held a meeting October 27 in La Grande Hotel at La Grande. Dr. W. K. Ross, president, presided.

Drs. Canfield Beattie and L. B. Bouvy of Portland presented scientific papers. Dr. J. D. Haun reported on the state association meeting at Eugene.

Dr. Bennett F. Roberts of Philadelphia has established offices in the Medford Center Building, to be associated with Dr. J. J. Emmens in the practice of eye, ear, nose and throat work. He is a graduate of University of Pennsylvania Medical School with four years postgraduate experience in the University and hospitals of Philadelphia.

KING COUNTY MEDICAL SOCIETY

Pres., Frederick Slyfield; Secty., A. J. Bowles

A general meeting of King County Medical Society was held in the auditorium of the Medical-Dental Building, Seattle, November 9. This was an adjourned meeting from November 2, which was not held in consequence of the sudden tragic death of President Russell J. McCurdy. President-elect Frederick Slyfield presided. About 250 members were present. Minutes of October 5 and November 2 meeting were read and approved.

Dr. Slyfield presented a tribute to the memory of Dr. McCurdy, citing his success as a physician and a friend of all who knew him. He was one of the most beloved members of the society. In honor of his memory the audience stood for a moment with bowed heads.

The following applicants for membership were elected: W. C. Alyen, C. C. Carter and Walter Kelton.

Dr. W. T. Woolley read a report of the committee on Harborview Hospital. He referred to the legislative conditions under which the trustees were appointed and their relation to the public. The conditions under which the hospital is functioning were mentioned, particularly of the character of patients admitted, emphasis being placed on the fact that they must be indigent and not possessed of material funds. The committee recommended that the title "King County Hospital" be adopted, which will more accurately describe the purpose of existence. The committee was unable to find any indorsement of the criticisms as to refusal of admission to suitable patients and the criticisms of their care. While the institution calls for a large expenditure for maintenance, this is unavoidable for one of its size and the work which it accomplishes.

The following amendment to the by-laws was presented, amending Article 8 by the addition of Section 5: "There shall be no assessment for the building fund during the year 1932."

A resolution was adopted, presented by the Pediatric Society, relating to preschool clinics.

The medical section of the society held a meeting November 9, with Dr. D. H. Nickson in the chair.

Dr. G. F. Strong of Vancouver, B. C., read a paper on, "Hypothyroidism." This may appear as mild, moderate or severe. Diagnosis depends upon more than lowered basal metabolic rate. Etiologic factors and symptoms were enumerated as well as physical signs and laboratory findings. Differential diagnosis must be made from nutritional disturbances, pernicious anemia, chronic nephritis and latent tuberculosis. Treatment was outlined.

Dr. O. J. West read a paper on, "A Discussion of the Reticuloendothelial System." Cells with identical characteristics are distributed through various tissues of the body. Different qualities were described, in which reside their especial adaptation to the duties they perform, being essentially for the defense and repair of body tissues. They also probably have chemical divisions. Blocking of the reticuloendothelial system influences antibody formation, hemolysis, anaphylactic shock and allergy. These studies are in their infancy and offer attractive future possibilities.

LEWIS COUNTY MEDICAL SOCIETY

Pres., H. B. Cravens; Secty., Rush Banks

Lewis County Medical Society met Nov. 9 for its regular meeting at the Lewis-Clark hotel in Centralia. The members were addressed by the following out-of-town physicians: H. J. Whitacre, Tacoma; D. A. Nicholson, Seattle; W. H. Penney, Tacoma, and G. E. Tripp, South Bend.

PIERCE COUNTY MEDICAL SOCIETY

Pres., R. C. Schaeffer; Sec., W. B. Penney

The regular meeting of Pierce County Medical Society was held in the auditorium in the Rhodes Medical Arts Building, Tacoma, November 10, Dr. R. C. Schaeffer presiding. Minutes of the previous meeting read and approved.

A paper on "Cardiac Syphilis" was given by Dr. P. V. Von Phul of Seattle. He presented four postmortem specimens of luetic hearts. He then read a paper which very thoroughly covered this subject, and was illustrated by roentgen slides, electrocardiograms and case reports. He believes in the energetic treatment of luetic heart disease in most cases and considers the roentgen-ray and electrocardiograph of great value in diagnosis. The paper was discussed by Drs. J. F. Steele, Light, McCarty and Penney.

Dr. J. W. Gullikson read a paper on "Pneumoconiosis," which fully covered the history and findings of this rather rare condition and was illustrated with roentgenograms. The paper was discussed by Drs. Crowe, Steele and McPhail.

The secretary stated that the trustees had considered the formation of a Woman's Auxiliary and approved of plans for such organization. Motion was made, seconded and carried, that Pierce County Medical Society approve plans for the organization of a Woman's Auxiliary.

The secretary reported that Pierce County Nurses' Association had requested the use of the Medical Arts Building Auditorium one night each month for the regular meeting of that association. The trustees recommended that the nurses be given permission to use the auditorium as requested without expense.

Pierce County Medical Society at its regular meeting Nov. 10 in the Medical-Dental Building at Tacoma, was addressed by P. V. von Phul in an illustrated lecture on blood diseases. Other speakers included Drs. J. F. Steele, J. W. Gullekson, V. E. Crowe and C. Quevli, Jr.

SNOHOMISH COUNTY MEDICAL SOCIETY

Pres., E. M. Adams; Secty., W. F. West, Jr.

Snohomish County Medical Society held its regular monthly meeting at Everett Tuesday, Nov. 3. The society was addressed by Drs. H. J. Whitacre of Tacoma, state association president; and also by Dr. A. H. Peacock of Seattle, who discussed medical economics. Great interest was displayed as shown by active discussion. Officers elected for the ensuing year were H. J. Greer, East Stanwood, president; L. G. Woodford, vice-president, Everett; L. J. Ferrell, secretary, Everett; E. M. Adams, treasurer, Everett. Delegates named for the state association were E. C. Leach, Arlington, and C. L. Hoeffler, Everett.

YAKIMA COUNTY MEDICAL SOCIETY

Pres., Kay England; Secty., R. W. Shirey

The regular meeting of the Yakima County Medical Society was held at Ellensburg Nov. 7, with Dr. W. A. Taylor as host.

The scientific discussion was opened by Dr. A. B. Hepler, of Seattle, who gave an illustrated paper on "Hydronephrosis." Dr. J. T. Mason, of Seattle, followed with a paper on "Gallbladder Surgery and Some of Its Complications."

Dr. H. J. Whitacre, President of the State Medical Association, addressed the meeting on "The Problems of the Medical Profession." He gave a short resume of existing committees and objectives of the state association.

Routine business concluded the session.

POCATELLO MEDICAL SOCIETY

Pres., C. F. Schiltz; Secy., W. F. Howard

The regular November meeting of Pocatello Medical Society was held at St. Anthony's Mercy Hospital, Dr. C. F. Schiltz, president, in the chair.

A full attendance was present. On motion of Dr. D. C. Ray, seconded by Dr. E. N. Roberts, the standing orders for day nursing in use by the Metropolitan Life Company in Pocatello was endorsed. Copy filed.

Thursday, December the 3rd, was set by motion and unanimous consent for the election of officers for 1932.

Dr. E. N. Roberts reported a conversation with Dr. Pearse of Salt Lake City. relative to the 1933 Tristate meeting at Yellowstone National Park. Utah desires to join this interstate Association.

Rev. Joseph Chester, Ph. D., presented the subject of psychotherapy in a masterly manner. This topic developed so great an interest that it occupied the rest of the meeting time. Discussion continued by Drs. Brothers, Howard, Call, Young, McKinnon, Newton and Pond, and finally it was decided to continue the subject at some future meeting.

Dr. E. N. Roberts, President-elect at the Idaho State Medical Association, announced that he will give a dinner to the membership of the Pocatello Medical Society on December 3, and invited the entire membership to be his guests at that date.

BOOK REVIEWS

Edited by KENELM WINSLOW, M.D.

BEDSIDE INTERPRETATION OF LABORATORY FINDINGS. By Michael G. Wohl, M.D., Associate Professor of Experimental Medicine, Temple University Medical School, etc. With an Introduction by Joseph McFarland, M.D., Sc.D., Professor of Pathology, University of Pennsylvania. Illustrated. 321 pp. $6.00. The C. V. Mosby Co., St. Louis, 1931.

In this treatise the application and utilization of laboratory methods are approached more from the clinician's viewpoint than that of the clinical pathologist. It is recommended that the practitioner do as much of his own laboratory work as possible, largely in order to "arouse greater interest in the welfare of his patient." Unfortunately, it presupposes a greater knowledge of laboratory technic than seems prevalent and does not take into account the time element.

In the first four chapters dealing with examination of sputum, gastric contents, duodenal contents and feces respectively, the routine methods are well covered and illustrated. Demonstration of spirochetes in sputum and estimation of pancreatic ferments are comparatively recent advances. The superiority of the alcohol test meal is insufficiently stressed. In the chapters on blood, the description and significance of abnormal red cells are excellent. The Schilling and similar classifications of neutrophiles are viewed with proper perspective, being covered in a page and a half. The cuts illustrating some abnormalities of white cells, as leucemia, would be misleading to a novice, since, though not so labelled, they are Giemsa stained, and give a different picture from the commonly used Wright's stain. The guttadiaphot reaction is outlined. The chapter on blood chemisty is concise and well presented.

The methods of examination of urine and their interpretation, particularly in regard to diagnosis of nephritis, are presented in a manner well ahead of the usual. Proposed liver functional tests are described and evaluated. Unfortunately Graham's phenoltetaiodophthalein test, probably the most valuable, is overlooked. Examination of cerebrospinal fluid, the skin reactions, as the von Pirquet, Mendel, Montoux, Schick and Dick test are well covered. In addition there is an excellent final chapter on laboratory test for the diagnosis of pregnancy. The Ascheim-Zondek, Siddall, Mazer and Hoffman are described. Friedman's modification of the Ascheim-Zondek test, which is the most valuable, is omitted. CEFALU.

A TEXT-BOOK OF NEURO-ANATOMY. By Albert Kuntz, Ph.D., M.D., Professor of Mico-anatomy in St. Louis University School of Medicine. Illustrated with 197 Engravings. 359 pp. $5.50. Lea & Febiger, Philadelphia, 1931.

This is a text-book devoted to the minute anatomy of the human nervous system for the purpose of giving the student an adequate conception of the intricacy of the subject and at the same time presenting it in such a way that he may gain an adequate understanding for the purpose of the vertebrate nervous system and to discuss the anatomic structure of the parts of the human nervous system in the light of the present knowledge of developmental and physiologic relationships. This the author has accomplished successfully. Fundamentally, however, the book does not differ from other texts on the subject. When its contents are analyzed one cannot help but come away with the feeling that the subject matter will interest only those who are devoting their time to dealing with the nervous system from the standpoint of the anatomist and the physiologist rather than from the viewpoint of the clinical practitioner, excepting, of course, the diagnostic neurologist and the neurosurgeon.

The chapters dealing with the various aspects of the anatomic nervous system do not give much in the way of hints or suggestions which can be construed as directly helpful to the clinician in the solution of his diagnostic and therapeutic problems, and certainly more experimentation either with animals or where possible on the human subject is necessary. The subject matter is well arranged and the illustrations are clean cut. The book should be of chief value to those who are doing research work or are interested in postgraduate study in the fields of anatomy, physiology, pathology, neurology and surgery of the cerebrospinal nervous system. ROHWER.

THE PRACTICE OF MEDICINE: By A. A. Stevens, A. M., M. D., Professor of Applied Therapeutics in the University of Pennsylvania; Visiting Physician to Philadelphia General and University Hospitals; Consulting Physician to St. Agnes' Hospital, Philadelphia. Third Edition, Entirely Reset. 1150 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1931. Cloth, $8.00 net.

This book presents the essentials of internal medicine very competently. Its style and scope equal those of any of the more valued American editions of like composition. It includes not only the basic teachings in this field but also the conservatively accepted advances outlined in the current literature.

The diagnosis and the treatment of diseases of the various systems are considered especially with a concise and a comprehensive insight. One is delighted particularly to note how well the author treats the subjects of tuberculosis, the disorders of metabolism, the diseases of the stomach, the liver and the pancreas, the diseases of the kidney and those of the blood-forming organs and the anemias. The book as an aid in the study of the essentials of internal medicine meets the requirements of students, general practitioners and specialists. BOWERS.

SIMPLE LESSONS IN HUMAN ANATOMY. By B. C. H. Harvey, M.D., Professor of Anatomy, University of Chicago. 434 pp. $2.00. American Medical Association, Chicago, 1931.

This work represents material that has been published in Hygeia. Although human anatomy is its main subject, it also has considerable histology, embryology and physiology. There is a smattering of chemistry and endocrinology. The book contains a wealth of material, well arranged, clearly and pleasantly written. One special feature is a chart called "the human factory" which represents pictorially "a very mechanical and simple idea of the important engines of the human body." There are many valuable pictures, including illuminating drawings of gross and microscopic anatomy. There is also an index which adds tremendously to the value of the book.

It will be hard for this book to place itself. In spite of its interest and clarity the average intelligent reader will occasionally need a dictionary, unless he has more than average learning in medicine and anatomy. The average

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physician, while enjoying the book, will not be inclined to buy it for his own personal use. It is intended primarily to instruct the layman in the principles of human anatomy. In putting so much wealth of material within such a short space the author has almost accomplished a short cut to learning, but not quite. METHENY.

APPROVED LABORATORY TECHNIC; Clinical, Pathological, Bacteriological, Serological, Biochemical, Histological. Prepared under the Auspices of The American Society of Clinical Pathologists. By John A. Kolmer, M.D., Dr. P.H., D. Sc., LL.D. Professor of Pathology and Bacteriology, Graduate School of Medicine, University of Pennsylvania, etc. And Fred Boerner, V.M.D., Associate Professor of Bacteriology, Graduate School of Medicine, University of Pennsylvania. Assisted by C. Zent Garber, A.B., M.D., Associate in Pathology, Peking Union Medical College, etc. With 11 Colored Plates and 300 Illustrations in the text. 663 pp. D. Appleton and Company, New York and London, 1931.

The title indicates the character of this book. Its purpose is "to establish standards for the performance of various laboratory examinations, to promote the practice of scientific medicine by wider applications of clinical laboratory methods to the diagnosis of disease and to encourage a closer cooperation between the practitioner and the clinical pathologist." It would seem, however, that the book would be much better for the laboratory technician than for the practitioner. It is certainly a desirable standard text-book for most of the work in the clinical laboratory, but it gives little on conclusions to be drawn from the laboratory report and still less on the correlation of laboratory work and clinical findings.

The chapter on the examination of the stomach contents is especially exhaustive and the authors seem to give undue importance to the laboratory findings in making the diagnosis. In the chapter on the examination of the blood Arneth's classification and Schilling's classification are given such scant space that it can be little if any aid to the technician. The chapter on the chemical examination of the blood seems especially satisfactory. The book is a distinct addition to the works on laboratory technic and it is to be hoped that it will find a place in every laboratory.

GRISWOLD.

THE NURSES' LEXICON. For the Use of Graduate and Student Nurses, for Premedical and Dental Students and for the General Public. By Thomas Lathrop Stedman, A.M., M.D. Editor of the "Twentieth Century Practice of Medicine," etc. 625 pp. $2.00. William Wood & Company, New York.

Anyone associated with medical practice, whether physician or nurse, finds a suitable medical dictionary indispensable. This volume comprises the words and definitions in most common use which are needed by the student, nurse and layman desiring accurate information on medical terms. The author is an authority along these lines, being well known as the author of a standard medical dictionary. This volume is of suitable size for ready reference and can be commended to those wishing a medical dictionary of small size.

THE MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month). Volume 15, No. 3, (Chicago Number—November, 1931). Octavo of 227 pp. with 53 illustrations. Per Clinic Year, July 1931 to May 1932. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London; W. B. Saunders Company, 1931.

This number presents clinical reports from Chicago practitioners connected with leading hospitals in that city. While numerous subjects are covered by these reports, there are several on various diseases of the heart, lungs and stomach. If one wishes to peruse the latest information pertaining to certain diseases of these organs he will find interesting reading in these clinical reports. As is true of all these publications, one observes practical suggestions derived from recent clinical experiences which compose the information desired by every practitioner.

THE MEDICAL RECORD VISITING LIST FOR 1932. Contents: Calendar, July 1931-June 1933. Estimation of Probable Duration of Pregnancy, Approximate Equivalents of Temperature, Weight, Capacity, Measure, etc. Maximum Adult Doses by the Mouth, in Apothecaries' and Decimal Measures. Drops in a Fluid Drachm. Solutions for Subcutaneous Injection. Solutions in Water for Atomization and Inhalation. Miscellaneous Facts. Emergencies. Artificial Respiration. Signs of Death. Hints on the Writing of Wills. Table of Signs. Visiting List and Special Memoranda. Consultation Practice. Obstetric Engagements. Record of Obstetric Practice. Record of Vaccinations. Register of Deaths. Nurses' Addresses. Addresses of Patients and Others. Cash Account. Price $2.00 net. William Wood & Co., New York.

RECENT ADVANCES IN INTERPRETATION OF ELECTROCARDIOGRAM. In answer to the question of what is the place of the electrocardiograph in clinical medicine, Louis N. Katz, Chicago (*Journal A. M. A.*, Nov. 7, 1931), states that it is not, as some believe, the final authority on all ailments of the heart, nor is it, as others hold, an unpractical toy for the curious, an impressive hoodwink for the unscrupulous, or a good investment for the mercenary. The value of the electrocardiogram in elucidating the applied physiology of the heart in the last thirty years has been extraordinary. It is still useful in many ways in clinical medicine; viz., (1) in determining the nature of cardiac irregularities, (2) in estimating myocardial involvement, (3) in locating valvular or congenital lesions, and (4) in aiding the management of cardiac cases. Too much must not be expected from the electrocardiograph. While the electrocardiograph has a definite place in clinical practice, it cannot replace the customary methods of making a diagnosis, as some physicians have imagined. The author discusses in detail the value of the electrocardiogram in disturbances in cardiac mechanism, in myocardial involvement, in ventricular preponderance and in the management of cases of arrhythmia.

HUMAN SIDE OF THE HOSPITAL. Joseph Brenneman, Chicago (*Journal A. M. A.*, Nov. 14, 1931), states that after an extended experience with a dozen widely differing hospitals, as intern, attending physician, visitor and patient, his attitude toward a given hospital centers in the emotions, in the heart, rather than in the mind, and he believes that reaction is freely shared by others. It is not the idealness of equipment and of organization but the subtler spirit of enthusiastic and self-effacing cooperation, of steadfast, sympathetic loyalty and devotion to a common cause that is bigger than any individual, that makes hospitals. It is the atmosphere, the morale of a hospital, that makes or wrecks its reputation and its usefulness. The children may be well cared for; the medical staff may be as wise as Solomon and as "just" as Aristides, and may see that the whole machinery of administration is well oiled and the physical equipment faultless; the board of trustees and the women's board may be actively interested and may do all that could be desired in other ways; nurses and interns may be excellent; and yet the vital spark will be lacking if there is not back of it all an all-pervading spirit of cooperation and of kindliness or, as Emerson has so beautifully expressed it, "an element of love that permeates it."

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PEST-HOUSE DAYS ARE IN DIM PAST

The day of the pest-house is over, writes Dr. W. W. Bauer in the January *Hygeia*. Anyone who calls a hospital by that name is fifty years out of date. This is the day of isolation or contagious disease hospitals, he writes.

In the old days there was a shack at the edge of town in which persons with contagious diseases were isolated without proper care. It was difficult even to get nurses to care for them. Parents punished their children if they played within a mile of the pest-house.

Today contagious diseases are in isolation wards of the hospitals. Modern methods of care eliminate the danger of cross-infection. Even visiting is possible by having glass enclosed corridors for the visitors. Children with contagious diseases get better care than would be possible at home, and mothers are saved from the wear and tear of sleeplessness and worry.

WOMEN'S STYLES GAIN APPROVAL OF OBSTETRICIANS

The sensible dress that American women have adopted in the last twenty years has the emphatic approval of obstetricians, says Dr. Edward Lyman Cornell in the January issue of *Hygeia*. The improvement, especially in corsets, has been of inestimable value in the reduction of infant mortality, he declares. Women must refuse to endorse any attempt on the part of fashion makers to lead them back to the long, dust sweeping skirts and body constricting corsets of the past.

The main principle for the prospective mother to bear in mind is not to bind the body anywhere, Dr. Cornell points out. For the first three months of pregnancy the clothing now in vogue is quite satisfactory. Shortly thereafter it is necessary to change to larger garments. Inconspicuous dress is always in good taste and never more so than in the case of the prospectvie mother.

FAMILY DOCTOR SHOULD RETURN, WRITER ASSERTS

Specialism in the field of medicine is overdone, writes Dr. J. Bayard Clark in the January issue of *Hygeia*. A recent survey of the ills to which the human race is heir shows plainly enough that the great majority of all sickness is due to minor accidents or infections that do not need the services of the specialists, he asserts.

What is more important is the return of the family doctor, who used to know the family history, the financial circumstances, and on whose loyalty both the family and the individual could always depend, says Dr. Clark.

However, the practitioner today has more scientific knowledge and more training than the country doctor of yesterday, as is plainly shown by the qualifications that he is required to pass.

The present problem is not the high cost of illness, but the high cost of human stupidity, says Dr. Clark. There is a need of periodic physical examinations. An annual balance of the book of health would keep people from getting hopelessly behind not only in their health account but in their bank account as well.

If the family doctor were adequately repaid for periodic examinations of each family, he would not have to charge so heavily in cases of emergency. Fewer doctors would be needed in the future because disease would be greatly diminished or eradicated by watchful care.

MEDALLIONS MARK HISTORICAL EVENTS IN MEDICAL WORLD

Historical events and movements are frequently recorded on medallions, or medals, as they are more popularly known. These pieces of metal, generally circular, are usually engraved with a figure, scene or allegorical group and serve to bring before the public some special occasion, like the celebration of a notable event in history, the founding of an institution or society or the achievement of some outstanding person.

The part played by medallions in the development of the child welfare movement is described in the January *Hygeia* by Dr. A. Levinson, who has a large collection of medals dealing with medical history.

One of the medals in Dr. Levinson's collection commemorates the founding of the French Society for the Protection of Infancy. It portrays a mother holding a child in her arms and leading another by the hand. Another shows a mother with an infant at her breast while she feeds another child with a spoon. This medallion celebrated the passing of the famous "loi Roussel" for the protection of the infants of peasant women, who often neglected their own babies to nurse those of the rich.

Handsome medals honor Victor Hugo and Jean Jacques Rousseau, both of whom did much for children. An American medal honors Dr. Abraham Jacobi, the first professor of pediatrics in this country, who directed propaganda for breast milk and who was instrumental in the passage of considerable child welfare legislation.

Observations of a Laryngologist. R. C. Lynch, New Orleans (*Journal A.M.A.*, Dec. 13, 1930), relates some of his experiences in practice and makes some clinical observations: for instance, vocal nodules, either in young children or in adults, a retention cyst, and the earliest manifestation of cancer are the only tumors that grow from the free edge of the vocal cords. Fibroma angioma and their combinations, pedunculated tumors of various types, all start on the under or the upper surface of the cord; this is also true of hemorrhagic blebs. Contact ulcers are the results of excessive abuse of the voice during acute inflammatory reaction. All other ulcers are of special etiology. A simple chronic ulcer never occurs in the larynx; its etiology must be sought for. Single pedunculated papilloma in the child is different in its behavior from the multiple type; the prognosis is better. Dissection with the aid of suspension gives the best results. The same tumor in the adult is practically always malignant. The earliest carcinoma of the larynx springs from the middle third of the vocal cord. Eight cases of metastasis to the lung have been observed in truly intrinsic cases, all discovered by accident, four substantiated by autopsy. Diathermy coagulation under suspension is of real value in properly selected cases; chloroform is used. All laryngectomies are done in one stage. Biopsy should be done only if operation is agreed to; under this plan, no evidence of harm thus far occurred. Deficiencies in diet, allergic states, endocrine unbalance and low akinetic exposure from the etiologic quadrad of sinus disease in children; any one, any combination or all four may be the fault. Infection with pathologic change may exist even when the quadrad seems normal. Malignant nasopharyngeal tumors are significant for lack of rhinologic symptoms. Salivary calculus will resemble sarcoma or mixed tumor disease. Diathermy will light up and produce progress toward increased deafness in otosclerosis. Sinus thrombosis is comparatively rare, far south. The inferior turbinate is an essential organ on the coast line, and especially far south. The wide nose of the Negro with its large turbinates will mislead the uninitiated. The greater the dilution with the white race, the less is the resistance. Allergic reactions are scarce in real Negroes, who seem less sensitive.

Pregnancy and Tuberculosis. Harvey B. Matthews, Brooklyn, and Louise Stevens Bryant, New York (*Journal A.M.A.*, Dec. 6, 1930), sent a questionnaire to 1,000 married women graduates of Trudeau Sanatorium, inquiring as to their experience with child-bearing. Nearly half responded, 484 in enough detail to make possible certain comparisons and observations, which are presented. One-third of the 484, or twice the highest figure set for involuntarily sterile marriages, never became pregnant. (Estimates for involuntarily sterile marriages range from one in six to one in ten). The other two-thirds proceeded with caution. They became pregnant only about half as frequently as the average, if the women attending birth control clinics can be taken as the average. Finally, they brought to living birth a far smaller proportion of the children conceived than appears usual. Just over half of the group, 287, bore even one living child, and these bore a scant two apiece. Those who bore more than one or two living children had done so before contracting tuberculosis. Losses before and immediately after birth were disproportionately high, averaging thirty-five to every hundred living births. But losses after birth were extremely infrequent. Most of the babies were breast fed and kept on a careful regimen, and nearly all were given medical examination, so that only a third of the expected number died in infancy, and few thereafter. Of the 579 children born alive, 556 were still alive when their mothers reported, fifteen years later. The majority of these women did not claim any relationship between tuberculosis and pregnancy. Only one-third of those pregnant at any time found that the disease began or recurred with a pregnancy or after a delivery or an abortion. But, of all women pregnant before "cure," 44 per cent had found their tuberculosis adversely affected. The more advanced the tuberculosis, the more deleterious the effect of pregnancy. The women who took sufficient time before getting pregnant after being "cured" (three years or more), and who obeyed all rules and regulations after leaving Trudeau, fared better than those who did not. Postpartum hemorrhage occurred in a very large proportion, amounting to 44 out of 317 cases, or 13 per cent. Menstrual disorders were very common among this group of tuberculous women, being reported by 47 per cent. Out of the 579 children born, 556 are alive, and 501 are healthy and well. Fifty-five are below par, and only 9 of these have had tuberculosis in any form, or have been suspected.

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President, W. F. Passer	Secretary, H. N. Leete
Twin Falls	Twin Falls
Tri-County Society (Latah, Benewah, Clearwater)	
President, J. H. Einhouse	Secretary, C. M. Husted
Moscow	Elk River
Upper Snake River Society	
President, R. H. Fisher	Secretary, W. R. West
Rigby	Rigby

OREGON

Benton County Society	
President, W. T. Johnson	Secretary, J. H. Garnjobst
Corvallis	Salem
Central Willamette Society	
President, N. L. Tartar	Secretary, Henry Garnjobst
Corvallis	Corvallis
Central Oregon Society	
President, B. F. Ferrell	Secretary, J. W. Thom
Bend	Bend
Clatsop County Society	
President, F. E. Fowler	Secretary, E. J. Jasper
Astoria	Astoria
Coos-Curry Counties Society	
President, R. H. Mast	Secretary, J. M. Simpkin
Myrtle Point	Marshfield
Douglas County Society	
President, A. C. Seely	Secretary, J. C. Twitchell
Roseburg	Roseburg
Eastern Oregon District Society	
President, J. P. Brennan	Secretary, Lewa Wilkes
Pendleton	La Grande
Jackson County Society	First and Last Wednesday
President, G. W. Gregg	Secretary, E. W. Shockley
Ashland	Medford
Klamath and Lake Counties Society	
President, C. E. Leithead	Secretary, C. V. Rugh
Lakeview	Klamath Falls
Lane County Society	
President, O. A. Waller	Secretary, H. G. Talbot
Eugene	Eugene
Mid-Columbia Society	
President, M. Thrane	Secretary, C. C. Chick
Hood River	Hood River
Polk-Yamhill-Marion Counties Society	First Tuesday
President, G. C. Knott	Secretary, W. W. Baum
Independence	Salem
Portland City and County Society	
President, N. W. Jones	Secretary, H. P. Rush
Portland	Portland
Southern Oregon Medical Society	Grants Pass
President, D. M. Brower	Secretary, E. A. Woods
Ashland	Ashland
Tillamook County Society	
President, M. R. Charlton	Secretary, David Robinson
Tillamook	Tillamook
Oregon Ophthalmological and Oto-Laryngological Society	Third Tuesday—Good Samaritan Hospital
President, J. L. McCool	Secretary, A. J. Browning
Portland	Portland

WASHINGTON

Chelan County Society	
President, J. E. Gahringer	Secretary, A. E. Gerhardt
Wenatchee	Wenatchee
Clallam County Society	3rd Tuesday—Port Angeles and Sequim
President, William Douglas	Secretary, W. H. Taylor
Port Angeles	Port Angeles
Clark County Society	Second Tuesday—Vancouver
President, A. E. Bird	Secretary, J. A. Darby
Camas	Kalama
Cowlitz County Society	
President, John Barton	Secretary, A. F. Birbeck
Longview	Longview
Grays Harbor County Society	
President, H. L. Hull	Secretary, L. R. Lightfoot
Elma	Aberdeen
Jefferson County Society	
President, J. F. Delaney	Secretary, H. C. Miller
Port Townsend	Port Townsend
King County Society	First Four Mondays—Seattle
President, D. H. Houston	Secretary, A. J. Bowles
Seattle	Seattle
Klickitat-Skamania Counties Society	
President, Allen Bonebrake	Secretary, J. R. Barber
Goldendale	White Salmon
Lewis County Society	Second Monday—Centralia and Chehalis
President, H. L. Petit	Secretary, Rush Banks
Chehalis	Centralia
Lincoln County Society	
President, Glen Snyder	Secretary, C. S. Baumgarner
Odessa	Davenport
Pacific County Society	Third Saturday—Raymond and South Bend
President, O. R. Nevitt	Secretary, G. A. Tripp
Raymond	South Bend
Pierce County Society	Second and Fourth Tuesdays—Tacoma
President, D. M. Dayton	Secretary, W. B. Penney
Tacoma	Tacoma
Skagit County Society	
President, W. L. Jackson	Secretary, W. N. Hunt
Burlington	Burlington
Snohomish County Society	First Tuesday—Everett
President, E. M. Adams	Secretary, R. B. Townsend
Everett	Everett
Spokane County Society	2nd and 4th Thursdays—Spokane
President, C. B. Ward	Secretary, R. P. DeRiemer
Spokane	Spokane
Stevens County Society	
President, W. H. Gray	Secretary, R. S. Wells
Colville	Colville
Thurston-Mason Counties Society	
President, C. W. Jones	Secretary, H. L. Lillibridge
Olympia	Olympia
Walla Walla Valley Society	2nd Thursday—Walla Walla
President, F. M. Campbell	Secretary, G. C. Daniels
Walla Walla	Walla Walla
Whatcom County Society	First Monday—Bellingham
President, E. C. Keyes	Secretary, W. A. Hulbrush
Bellingham	Bellingham
Whitman County Society	
President, J. L. Gilleland	Secretary, A. K. Harris
Pullman	Colfax
Yakima County Society	First and Third Mondays—Yakima
President, Kay England	Secretary, Ralph Shirey
Yakima	Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology	
President, W. F. Hoffman	Secretary, F. A. Brugman
Seattle	Seattle

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Pacific Northwest Medical Association	
President, G. W. Swift	Secretary, Frederick Epplen
Seattle, Wash.	Seattle, Wash.
Idaho State Medical Assn.	1931—Boise
President, D. E. Cornwall	Secretary, H. W. Stone
St. Maries	Boise
Oregon State Medical Society	1931—Eugene
President, T. E. Griffith	Secretary, F. D. Stricker
The Dalles	Portland
Washington State Medical Assn.	1931—Aberdeen
President, A. E. Anderson	Secretary, C. H. Thomson
Aberdeen	Seattle
University of Wash. Extension Course	1931—Seattle
North Pacific Pediatric Society	Jan., 1931
President, E. D. Kanaga	Secretary, H. T. Clay
Tacoma	Tacoma
Pacific Coast Oto-Ophthalmological Society	Sept. 3-5, 1930—Victoria, B. C.
President, Arthur Jones	Secretary, W. F. Hoffman
Boise, Ida.	Seattle
Pacific Northwest Orthopedic Assn.	1930—
President, O. F. Akin	Secretary, Chas. McClure
Portland, Ore.	Portland, Ore.
Med. Soc. of the State of California	April 27-30, 1931—San Francisco

Corrections and additions to this list are requested from the societies represented.

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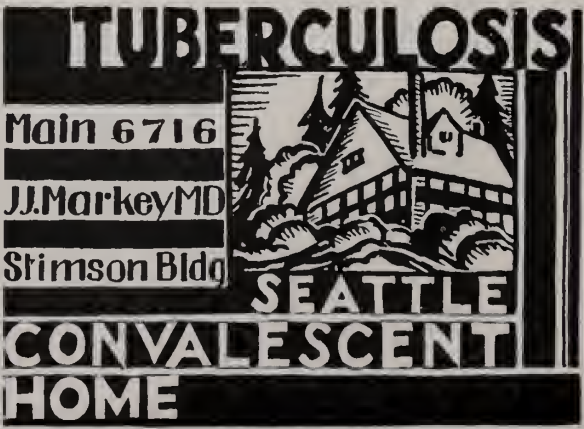

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IMPORTANT ANNOUNCEMENT

After January 1, 1931 The Laboratory Products Company will be known as S. M. A. Corporation.

Ever since 1921, when S. M. A. (an adaption to breast milk) was first announced generally to the Medical Profession, we have been constantly referred to as "the S. M. A. Company." Common usage, therefore, suggested the change from The Laboratory Products Company to S. M. A. Corporation. It is however, the same company, the same personnel and the same products. The same ethical policies which have guided us so many years will also be strictly maintained.

This change in corporation name was approved at a special meeting of the stockholders, December 10, 1930.

VITAMIN ADVERTISING AND THE MEAD JOHNSON POLICY

The present spectacle of vitamin and irradiation advertising running riot in newspapers and magazines and via radio emphasizes the importance of the physician as a controlling agent in the use of vitamin products.

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DO YOU LIKE MAPLE SUGAR?

Good maple sugar and pure maple syrup are prepared by L. Bamford at Plymouth, Wis. If you wish some of this wholesome and delicious product, refer to page 17.

Observations on Treatment of Syphilis of the Liver. Paul A. O'Leary, Rochester, Minn. (*Journal A. M. A.*, Jan. 17, 1931), believes, as a result of his study, that in cases in which hepatic syphilis is suspected and in those in which the evidence of such disease is conclusive the treatment should be limited to the use of mercury and iodides over a long period of time. This statement is made notwithstanding the fact that in a few of the proved cases of the three late forms of syphilis of the liver fairly intensive treatment with arsphenamine, mercury and iodides was given, with decided benefit. Study of the results of treatment in this series of cases, in which various procedures were employed, indicates that the system of treatment is not the factor which determines the eventual outcome of the disease. More important than the treatment in influencing the eventual course of the disease is the type and degree of the complication existing at the time treatment is instituted. If practically all of the hepatic cells are involved in the production of the clinical picture of diffuse hepatitis, the use of drugs which have an effect on the liver, such as arsphenamine and mercury, may result in further dysfunction and early death. If, however, the degree of hepatitis is less extensive and less intense, the use of drugs may be highly satisfactory. In cases in which dysfunction of the liver is suspected, but in which neither the type nor the degree is demonstrable other than by clinical impression, the use of mercury and iodides only is warranted. O'Leary has noted the best results when treatment was started by small doses of the drugs, which were then gradually increased for a period of six months. At the end of this time, the evidence of restitution, or the progress of the disease, will warrant amplification or limitation of further treatment. Other complications of syphilis may be a factor in determining the intensity of subsequent treatment. The blood of patients suffering from syphilis of the liver is prone to remain positive to the Wassermann reaction, and it usually is unwise to intensify treatment with the idea of reversing the Wassermann reaction to negative. In late forms of hepatic syphilis the continued use of mercury and iodides at intermittent intervals for several years has resulted in an average life expectancy of almost three times that when arsphenamine and mercury were used intensively. The early recognition of syphilis of the liver and the avoidance of methods of treatment that tend to produce hepatic injury are essentials in successful treatment.

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ANIMALS AIDED MEDICAL WORLD IN DISCOVERIES

Have human beings the right to experiment on living creatures for their own protection? Hardly a single medical discovery in the last forty years has been made without the aid of animals, says the editor of *Hygeia* in the February number. Only by the use of animals were the discoveries of insulin for diabetes and of liver for the treatment of anemia made.

The question of the utility of animal experimentation has long ago been settled, says *Hygeia*. Medical science could not have progressed without the use of animals, and endless human suffering has been alleviated by the discoveries made with animals. Yet, some sentimentally minded persons are at present trying to upset the progress of science by attempts to make laws to prevent pain to animals by scientific experimentation.

A question that is often put is whether or not it is ethical to cause pain to animals as an alternative to harmful experimentation on human beings and as a means of saving human life. That question is answered by the eminent philosopher, John Dewey, who is quoted by *Hygeia.*

The problem is one of deciding whether it is unethical to cause mere physical pain to animals—and that is almost wholly diminished by the use of anesthesia—or to allow human beings to suffer not only physically but to involve the moral sympathy and discomfort of those about them, and to render them unfit to fill their place in the world. Human illness causes much more than the physical pain, says Professor Dewey.

Until it is decided that the taking of animals for food is wrong there is something morally unsound in the agitation that questions the right to take the lives of animals for scientific experiments. Especially is this true since more precautions are taken to avoid suffering of animals in the case of expermientation than when they are slaughtered for food, says Professor Dewey.

The community at large is under obligation to see that scientists are not hampered by useless laws in carrying out these inquiries, he adds.

BILLION A YEAR, PRICE OF COLDS IN THIS COUNTRY

Colds cost the United States more than a billion dollars each year, in the opinion of Dr. James J. King, writing in the February *Hygeia*. Statistics show that an average of one and a half days per worker are lost because of colds, making a total of 90,000,000 days or about $500,000,000. The added cost of medical care and the inefficiency following a cold will easily add up another half billion, says Dr. King.

Though the germ that causes colds has never been discovered microscopically, doctors have learned that it is omnipresent and it sets to work in the body whenever the resistance is low. When the system is filled with poisons that are due to lack of proper elimination from the skin, the kidneys, lungs and intestines, and to fatigue, a cold is likely to make a headway.

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Bonners Ferry   Sandpoint

Canyon County Society........
President, S. B. Dudley   Secretary, T. C. Horton
Caldwell   Nampa

Idaho Falls Medical Society........
President, C. M. Cline   Secretary, A. R. Soderquist
Idaho Falls   Idaho Falls

Kootenai County Society........
President, J. W. West   Secretary, J. T. Wood
Coeur d'Alene   Coeur d'Alene

Nez Perce County Society........
President, W. P. H. Hahel   Secretary, R. T. Scott
Lewiston   Lewiston

Pocatello Medical Society........First Thursday—Pocatello
President, D. C. Ray   Secretary, W. F. Howard
Pocatello   Pocatello

Shoshone County Society........
President, G. H. Kennett   Secretary, J. R. Bean
Kellogg   Wallace

Southwestern Idaho Society........
President, W. A. Koelsch   Secretary, G. H. Wahle
Boise   Boise

South Side Society........
President, W. F. Passer   Secretary, H. N. Leete
Twin Falls   Twin Falls

Tri-County Society (Latah, Benewah, Clearwater)........
President, J. H. Einhouse   Secretary, C. M. Husted
Moscow   Elk River

Upper Snake River Society........
President, R. H. Fisher   Secretary, W. R. West
Righy   Righy

OREGON

Benton County Society........
President, W. T. Johnson   Secretary, Henry Garnjobst
Corvallis   Salem

Central Willamette Society........
President, D. C. Stanard   Secretary, Henry Garnjohst
Eugene   Corvallis

Central Oregon Society........
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Bend   Bend

Clatsop County Society........
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Astoria   Astoria

Coos-Curry Counties Society........
President, R. H. Mast   Secretary, J. M. Simpkin
Myrtle Point   Marshfield

Douglas County Society........
President, A. C. Seely   Secretary, J. C. Twitchell
Rosehurg   Rosehurg

Eastern Oregon District Society........
President, J. P. Brennan   Secretary, Lewa Wilkes
Pendleton   La Grande

Jackson County Society........First and Last Wednesday
President, G. W. Gregg   Secretary, E. W. Shockley
Ashland   Medford

Klamath and Lake Counties Society........
President, C. E. Leithead   Secretary, C. V. Rugh
Lakeview   Klamath Falls

Lane County Society........
President, O. A. Waller   Secretary, H. G. Talhot
Eugene   Eugene

Mid-Columbia Society........
President, M. Thrane   Secretary, C. C. Chick
Hood River   Hood River

Polk-Yamhill-Marion Counties Society........First Tuesday
President, R. L. Wood   Secretary, W. W. Baum
Salem   Salem

Portland City and County Society........
President, N. W. Jones   Secretary, H. P. Rush
Portland   Portland

Southern Oregon Medical Society........Grants Pass
President, D. M. Brower   Secretary, E. A. Woods
Ashland   Ashland

Tillamook County Society........
President, M. R. Charlton   Secretary, David Rohinson
Tillamook   Tillamook

Oregon Ophthalmological and Oto-Laryngological Society........
........Third Tuesday—Good Samaritan Hospital
President, J. L. McCool   Secretary, A. J. Browning
Portland   Portland

WASHINGTON

Chelan County Society........
President, R. T. Congdon   Secretary, A. G. Young
Wenatchee   Wenatchee

Clallam County Society......3rd Tuesday—Port Angeles and Sequim
President, R. S. Hamilton   Secretary, W. H. Taylor
Port Angeles   Port Angeles

Clark County Society........Second Tuesday—Vancouver
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Camas   Kalama

Cowlitz County Society........
President, John Barton   Secretary, A. F. Birheck
Longview   Longview

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President, E. B. Riley   Secretary, L. R. Lightfoot
Aberdeen   Aberdeen

Jefferson County Society........
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Port Townsend   Port Townsend

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Goldendale   White Salmon

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Pe Ell   Centralia

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Raymond   South Bend

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Tacoma   Tacoma

Skagit County Society........
President, George Crahtree   Secretary, W. N. Hunt
Mt. Vernon   Burlington

Snohomish County Society........First Tuesday—Everett
President, E. M. Adams   Secretary, R. B. Townsend
Everett   Everett

Spokane County Society........2nd and 4th Thursdays—Spokane
President, W. J. Pennock   Secretary, D. G. Palmer
Spokane   Spokane

Stevens County Society........
President, W. H. Gray   Secretary, R. S. Wells
Colville   Colville

Thurston-Mason Counties Society........
President, C. W. Jones   Secretary, H. L. Lillibridge
Olympia   Olympia

Walla Walla Valley Society........2nd Thursday—Walla Walla
President, F. M. Camphell   Secretary, G. C. Daniels
Walla Walla   Walla Walla

Whatcom County Society........First Monday—Bellingham
President, E. C. Keyes   Secretary, W. A. Hulhrush
Bellingham   Bellingham

Whitman County Society........
President, J. L. Gilleland   Secretary, A. K. Harris
Pullman   Colfax

Yakima County Society........First and Third Mondays—Yakima
President, Kay England   Secretary, Ralph Shirey
Yakima   Yakima

Puget Sound Academy of Ophthalmology and Oto-Laryngology........
President, W. F. Hoffman   Secretary, F. A. Brugman
Seattle   Seattle

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Aherdeen   Seattle

University of Wash. Extension Course........1931—Seattle

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Tacoma   Tacoma

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President, O. F. Akin   Secretary, Chas. McClure
Portland, Ore.   Portland, Ore.

Med. Soc. of the State of California........
........April 27-30, 1931—San Francisco

Corrections and additions to this list are requested from the societies represented.

PROFESSIONAL ANNOUNCEMENTS

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Girl desires a position who has had fifteen years experience in general office, physical therapy and routine laboratory work. Has specialized in radiography, the last year having been spent training students in X-ray and physical therapy work. Good personality and executive ability. Excellent references. Address W., care Northwest Medicine, Seattle.

X-RAY TECHNICIAN

Position wanted by X-ray technician. Have had nurse's training. Can furnish references. Address Eleanor C. Smith, 1220 Washington St., Boise, Ida. Telephone 1607M.

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Peptic and Duodenal Ulcer in Tabes Dorsalis. Edward Livingston Hunt and James R. Lisa, New York (*Journal A. M. A.*, Jan. 10, 1931), report four cases. In each instance the patient had been under observation, the clinical diagnosis had been agreed on, and the autopsy had been made. The essential points in these cases were: The presence of a nonsyphilitic ulcer in a syphilitic patient; the fact that the terminal stage of the disease was due to the ulcer and not to the tabes; the failure to diagnose the ulcer before death; the fact that the diagnosis was overlooked because of the similarity of the symptoms; the fact that in one case there were bloody stools, and proof from the autopsy that the patient had tabes.

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Hereditary Diabetes Mellitus. Samuel Kennedy, Shelbyville, Ind. (*Journal A. M. A.*, Jan. 24, 1931), has had the opportunity to study a family in which ten cases of diabetes have occurred in two generations. The first generation consisted of twenty-eight persons, the children of Mr. A and of his two sisters, Mrs. B and Mrs. C. Five were children of Mr. A; eleven, of Mrs. B; twelve of Mrs. C. Three persons were lost trace of more than thirty-five years ago. Of the remaining twenty-five, eight developed diabetes, while seventeen did not develop diabetes; eleven are now living, fourteen have died. Of the fourteen dead, four died of diabetes, while ten died from other causes, four in infancy. In this generation there have been five amputations of a leg for diabetic gangrene; three of the patients who underwent amputation are living, two have died of diabetes. Information is lacking for only three members of this generation. In the second generation, thirty-five persons were studied. Thirteen were the grandchildren of Mrs. B, twenty-two were the grandchildren of Mrs. C. So far, only two of this generation developed diabetes. Twenty-four of the thirty-five are living, one with diabetes, twenty-three free from the disease. Eleven are dead; one died of diabetes, ten died of other causes, five in infancy. Three of this generation died of tuberculosis. Information is lacking on none of this generation, except as to such children as the three untraced persons of the first generation may have had. Of the original brother and two sisters, from whom these three branches of the family sprang, there is reason to suspect diabetes in only one, Mrs. C. Her death took place in 1896, when much less was known about this disease than now. Her age at death was 71 years. According to the account given by her family, she had leg ulcers for several years previous to her death, and for several months she had had sore toes. She had also lost a great deal of weight. Her last illness began with a cold; vomiting set in, and she went into coma and died in three or four days. At the time, her condition was diagnosed "typhoid pneumonia."

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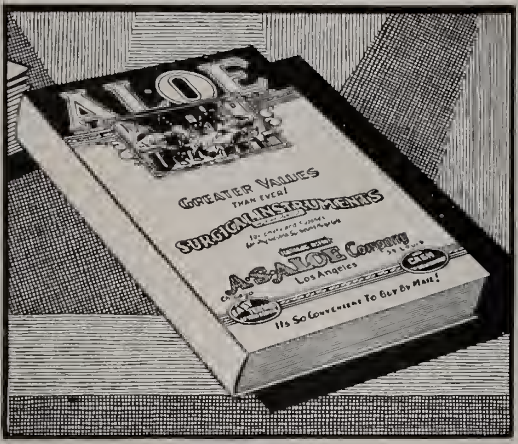

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S. M. A. is simple to prepare
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When physicians are confronted with undependable fresh milk supplies when feeding infants, especially in the summer time, it is well to consider the use of reliable powdered whole milk such as Mead's. Such milk is safe bacteriologically, of standard composition, is easily reliquefied, and is particularly desirable for the mother who takes her baby with her on her vacation. Under these conditions, Dextri-Maltose is the physician's carbohydrate of choice just as it is when fresh cow's milk is employed. The best method to follow is first to restore the powdered milk in the proportion of one ounce of milk to seven ounces of water, and then to proceed building up the formula as usual. Please send for our Literature No. 61 which gives practical working formulae for modifying powdered and dried milks, evaporated milk, lactic acid milk, protein milk and cow's milk. Mead Johnson & Company, Evansville, Ind.

DOCTORS ARE ADVISING LEISURELY BEGINNING FOR DAY'S ACTIVITIES

The news comes as a welcome word that physician's are advocating a leisurely beginning for the day. Some claim that fifteen minutes should elapse between the rising gong and the actual getting-up time and that there should be no strenuous activity before breakfast.

These are the new regulations for girl scout camps, as related in *Hygeia* by Margaret H. Speer. Girl scout authorities have deemed it advisable to eliminate setting-up exercises though they have not in any way denied the great value of exercise for girls from 12 to 18.

A study of young men in a Y. M. C. A. at Springfield, Mass., recently showed that number of the heart beats increases rapidly as soon as a person assumes a standing position upon arising. Consequently, Y. M. C. A. directors have also been advised to dispense with early morning setting-up exercises.

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Working from the fact that the natural diet for a human infant is its mother's milk, the Alpha Milk Laboratories have developed a milk powder which reconstructs into a product as nearly identical with mother's milk as it is possible to artificially produce. Realizing that a powder made from whole milk by any of the processes in general use was inadequate in vitamins for an infant's diet, it was determined that some method of drying would have to be evolved to preserve the efficiency of the vitamins, and in addition establish the physical and chemical character, percentages of protein, carbohydrate and fat of mother's milk. All of these factors were carefully coordinated in laboratory studies, and then in production experiments, with the result that Alpha-Lac is now offered as a complete diet for the infant unfortunate enough to be deprived of its mother's milk.

Preparation for use is simple. The physician need not fear the mistakes which are apt to be made by mothers who are unaccustomed to compound formulae. It contains all the essential food elements and vitamins necessary for the steady and healthy growth of the infant. If modification is indicated it can easily be accomplished.

Alpha-Lac brings results where ordinary milk modifications fail. Easily digested and readily assimilated, it can be fed with equally good results from birth to two or more years of age. It is free from all pathogenic bacteria. The most scrupulous cleanliness is observed throughout its entire process of manufacture. When the quality of the milk supply is doubtful, or where fresh milk is difficult or expensive to obtain, Alpha-Lac fills a long felt want. To the mother traveling with her infant it is invaluable.

Alpha-Lac is manufactured in a modern, sanitary factory in the heart of the dairy industry of California. A special process of manufacture is used whereby the fats in the food are oxidized and the complete product is of a highly soluble nature. Only strictly fresh grade "A" milk is used in Alpha-Lac, and due to close proximity to the dairy farms it reaches the Alpha Milk Laboratories immediately after milking. A low bacterial count in the milk is thereby assured.

Alpha-Lac has excellent keeping qualities, and is consistent in quality throughout. It is distributed and sold under the direction of the medical profession. Physicians are requested to send for samples, which will be gladly furnished in sufficient quantity to enable them to arrive at their own determinations.

PLAN MEALS AROUND SALAD AND VEGETABLES TO PROVIDE VITAMINS

Every mother and housekeeper needs to know enough about vitamins to plan for the health of her family. Meals are generally planned about the meat, yet it would be an excellent idea to reverse the method and to plan the meal around the salad and vegetables, writes Stella Randolph in her article "Visualizing the Vitamin" in *Hygeia*. Thus there would be no danger of not filling the vitamin requirements of the body.

Blindness may be caused from a lack of vitamin A; lack of vitamin B may cause berberi; without vitamin C scurvy may occur, and without vitamin D there is the possibility of rickets.

Vitamin A is found in butter, cream, egg yolk, liver, kidney and in the leafy vegetables. Vitamin B is in spinach, turnips, radishes, water cress, lettuce, raw cabbage, brussels sprouts. Vitamin C is in tomatoes, orange juice, celery, fresh peas and cabbage. The rickets-preventing vitamin D is in its greatest abundance in cod liver oil.

Adults as well as children need all of the vitamins, says Miss Randolph. What constitutes good food while we are young will serve well in later life.

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Two dentists wish a doctor to share offices with them in a prominent Seattle office building. Rental reasonable. He will be the exclusive physician in the building. Good practice should be developed. Address W. care Northwest Medicine, Seattle.

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Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nationwide connections enable us to give superior service. Aznoe's National Physicians Exchange, 30 North Michigan Chicago. Established 1896. Member The Chicago Association of Commerce.

HOSPITAL DAY CONTRIBUTION

S.M.A. Corporation did their bit to promote Hospital Day by ordering announcements May 11 and 12 over all the radio stations carrying their programs for their commercial product, Pantry Cream. The announcement included this statement: "Tuesday, May 12, is National Hospital Day, when hospitals all over America are inviting people to visit them. A popular feature will be the parties at maternity hospitals for babies born during the past year at these hospitals. Find out about the hospitals in your community by visiting them May 12. See what fine institutions they are, dedicated to the merciful and scientific care of human life, and operated by trained, hard-working, self-sacrificing doctors and nurses."

S.M.A. is recognized by most physicians to be the nearest existing approximation of mothers' milk. No directions are given on the lay package. Moreover, each can bears this statement: "Use only on order and under supervision of a licensed physician. He will give you instructions." It is advertised ethically to the medical profession only and sold exclusively through prescription pharmacies. More than a year ago the Research Division of S.M.A. Corporation discovered a method of putting cream in cans. This is a product sold to the public in grocery and delicatessen stores. It is advertised to the public by radio and newspaper.

COCOMALT EXHIBIT

At the American Medical Association Convention held in Philadelphia on June 8-12, visiting physicians noticed among the familiar exhibits, an attractive display of Cocomalt, the delicious chocolate flavor food drink. Cocomalt was served daily to the visiting physicians. The Cocomalt booth was one of the most popular booths at the convention. The physicians took advantage of the opportunity to have samples of Cocomalt forwarded direct to their homes and offices. Readers of this journal are well acquainted with Cocomalt and what it will accomplish. Cocomalt is an easily digested nourishing food that is as valuable for adults as it is for children.

It contains the nourishing elements of cocoa, eggs, barley malt, sugar, milk proteins and milk minerals. It comes in powder form, ready to be mixed with hot or cold milk. So mixed, Cocomalt increases the food value of milk more than 70 per cent. Every glass a child drinks is equal to almost two glasses of plain milk; yet it is so easily digested, so quickly assimilated, that even a delicate child can drink it five or six times a day. The extra proteins, minerals and carbohydrates thus supplied are highly valuable in building strong, husky little bodies. Actual gains of from four to six pounds a month are reported regularly by mothers all over the country.

PHILOSOPHY OF LIFE IS BUILT AROUND MAN'S FEAR OF DEATH

Fear of death is the greatest fear that overhangs mankind. About that fear man has built his philosophy and religion; even the belief in immortality is a token of the awful fear of death. So philosophizes Dr. J. Shelton Horsley in a *Hygeia* article.

It is the uncertainty of the beyond that makes us fear death. The actual process of dying is not as a rule accompanied by any great discomfort—just a lapse into unconsciousness. The consequences of the abolition of the fear of death would be extremely undesirable, believes Dr. Horsley.

Fear and pain are useful sensations. They forewarn a person of a disaster that may be averted. Pain in appendicitis causes a fear that something is wrong in the internal organization. That sends one to the hospital for an operation in time to save life.

Pain after injury, such as a broken bone, prevents the use of the affected part and so promotes healing. On the other hand, the lack of pain in the early stages of cancer is responsible for the high rate of mortality.

Dr. Horsley speaks of "a healthy amount of fear" that should exist in all persons, communities and nations. The fear of punishment or of disgrace is a potent factor in maintaining civilization. No mentally sound person is free from fear of ridicule of his fellowmen. Fear holds the social standard on a high plaine. To have the normal amount of fear and to be able to control it is ideal.

FAITH PLUS WORK IS NECESSARY FOR CURE OF DISEASES

At least 50 per cent of the human ills are functional—that is, they are not caused by underlying pathologic conditions but are the result of mental conflicts—estimates Dr. C. Raimer Smith. Anxieties, fear, sorrows and disappointments along with jealousy, domestic discords, anger and other emotional states produce functional ailments, Dr. Smith writes in *Hygeia.*

Pains of many kinds—headache, backache, paralysis, blindness, indigestion and many others—may be brought on by emotional conditions. However, the fact that there is no organic origin of these pains does not mean that they are less real or less distressing than organic disturbances, says Dr. Smith.

Before the days of psychoanalysis, the patient with a functional disorder would go to a physician who could find no apparent physical cause for the illness. Yet the patient still felt that he was ill and he finally drifted into the hands of a quack who catered to the subconscious emotional conflict and effected some kind of a "cure" because the illness had never been elsewhere than in the patient's mind. But let a person take an organic illness to a quack and there is a different story. The quack's appeal to the emotional conflict cannot cure a cancer or any other organic disease.

Yet faith, says Dr. Smith, must not be depreciated. It always takes faith plus plenty of work to cure a disease. Only after a physician has done all that he can do should a patient expect an answer to his prayers.

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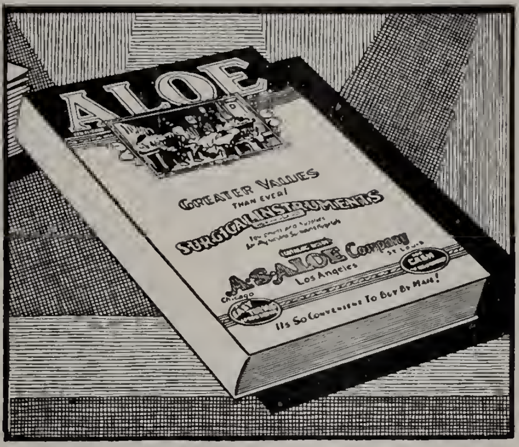

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It is not necessary to further modify S.M.A. for normal full term infants, for the same reason that it is not necessary to modify breast milk - for S.M.A. contains the essential food elements in proper balance. Because of this close resemblance to breast milk, the very young infant can tolerate the fat as well as the other essential constituents of S.M.A. and it is possible to give it in the same strength to normal infants from birth to twelve months of age.

As the infant grows older, therefore, it is only necessary to increase the total amount of S. M. A. diluted according to directions.

Orange juice, of course, should be given the infant fed on S.M.A. just as it is the present practice to give it to breast fed infants, to supply an adequate amount of the anti-scorbutic vitamin "C".

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the bottle-fed baby exhibits symptoms indicating partial vitamin B deficiency—described by Hoobler as (1) anorexia, (2) loss of weight, (3) spasticity of arms and legs (4) restlessness, fretfulness, (5) pallor, low hemoglobin, etc.—

Dextri-Maltose with Vitamin B may be used in adequate amounts (up to 71 Chick-Roscoe units) without causing digestive disturbance. This ethically advertised product derives its vitamin B complex from an extract of wheat germ rich in B and brewers yeast rich in G. Physicians who have attempted to make vitamin B additions to the infant's formula but who have been obliged to abandon same due to diarrheas or other unfortunate nutritional upsets, will welcome Mead's Dextri-Maltose with Vitamin B. This is a tested product with rich laboratory and clinical background and is made by Mead Johnson & Company, a house specializing in infant diet materials.

Not all infants require vitamin B supplements, but when the infant needs additional vitamin B, this product supplies it together with carbohydrate. In other cases, the carbohydrate of choice is Dextri-Maltose No. 1, 2 or 3.

DO YOU WANT A GOOD LAUGH?

Then read "A Dog's Life. The Trail of a Little Yellow Runt," by Jo Anderson. James Whitcomb Riley said Runt was the world's funniest poem. For men may come and men may go, but Runt flowed on forever. It costs 75 cents and is sold by Pound Publishing Company, Chattanooga, Tenn.

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Lewiston	Lewiston
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President, D. C. Ray	Secretary, W. F. Howard
Pocatello	Pocatello
Shoshone County Society	
President, G. H. Kennett	Secretary, J. R. Bean
Kellogg	Wallace
Southwestern Idaho Society	
President, W. A. Koelsch	Secretary, G. H. Wahle
Boise	Boise
South Side Society	
President, H. W. Clouchek	Secretary, H. N. Leete
Twin Falls	Twin Falls
Tri-County Society (Latah, Benewah, Clearwater)	
President, J. H. Einhouse	Secretary, O. M. Husted
Moscow	Elk River
Upper Snake River Society	
President, L. A. Rich	Secretary, Clamor Gavin
Rexburg	Rigby

OREGON

Benton County Society	
President, W. T. Johnson	Secretary, Henry Garnjobst
Corvallis	Salem
Central Willamette Society	
President, D. C. Stanard	Secretary, Henry Garnjobst
Eugene	Corvallis
Central Oregon Society	
President, B. F. Ferrell	Secretary, J. W. Thom
Bend	Bend
Clatsop County Society	
President, G. S. Morgan	Secretary, Joseph McConnell
Astoria	Astoria
Coos-Curry Counties Society	
President, R. H. Mast	Secretary, J. M. Simpkin
Myrtle Point	Marshfield
Douglas County Society	
President, A. C. Seely	Secretary, J. C. Twitchell
Roseburg	Roseburg
Eastern Oregon District Society	
President, J. P. Brennan	Secretary, Lewa Wilkes
Pendleton	La Grande
Jackson County Society	First and Last Wednesday
President, G. W. Gregg	Secretary, E. W. Shockley
Ashland	Medford
Klamath and Lake Counties Society	
President, R. W. Stearns	Secretary, Harold Brown
Klamath Falls	Klamath Falls
Lane County Society	
President, O. A. Waller	Secretary, H. G. Talbot
Eugene	Eugene
Mid-Columbia Society	
President, M. Thrane	Secretary, C. C. Chick
Hood River	Hood River
Polk-Yamhill-Marion Counties Society	First Tuesday
President, R. L. Wood	Secretary, W. W. Baum
Salem	Salem
Portland City and County Society	
President, N. W. Jones	Secretary, H. P. Rush
Portland	Portland
Southern Oregon Medical Society	Grants Pass
President, B. R. Shoemaker	Secretary, E. A. Woods
Roseburg	Ashland
Tillamook County Society	
President, M. R. Charlton	Secretary, David Robinson
Tillamook	Tillamook
Oregon Ophthalmological and Oto-Laryngological Society	Third Tuesday—Good Samaritan Hospital
President, J. L. McCool	Secretary, A. J. Browning
Portland	Portland

WASHINGTON

Chelan County Society	
President, R. T. Congdon	Secretary, A. G. Young
Wenatchee	Wenatchee
Clallam County Society	3rd Tuesday—Port Angeles and Sequim
President, R. S. Hamilton	Secretary, W. H. Taylor
Port Angeles	Port Angeles
Clark County Society	Second Tuesday—Vancouver
President, A. E. Bird	Secretary, J. A. Darby
Camas	Kalama
Cowlitz County Society	
President, John Barton	Secretary, A. F. Birbeck
Longview	Longview
Grays Harbor County Society	
President, E. B. Riley	Secretary, L. R. Lightfoot
Aberdeen	Aberdeen
Jefferson County Society	
President, J. F. Delaney	Secretary, H. C. Miller
Port Townsend	Port Townsend
King County Society	First Four Mondays—Seattle
President, R. J. McCurdy	Secretary, A. J. Bowles
Seattle	Seattle
Klickitat-Skamania Counties Society	
President, Allen Bonebrake	Secretary, J. R. Barber
Goldendale	White Salmon
Lewis County Society	Second Monday—Centralia and Chehalis
President, H. B. Cravens	Secretary, Rush Banks
Pe Ell	Centralia
Lincoln County Society	
President, Glen Snyder	Secretary, C. S. Baumgarner
Odessa	Davenport
Pacific County Society	Third Saturday—Raymond and South Bend
President, O. R. Nevitt	Secretary, G. A. Tripp
Raymond	South Bend
Pierce County Society	Second and Fourth Tuesdays—Tacoma
President, Ralph Schaeffer	Secretary, W. B. Penney
Tacoma	Tacoma
Skagit County Society	
President, George Crabtree	Secretary, W. N. Hunt
Mt. Vernon	Burlington
Snohomish County Society	First Tuesday—Everett
President, E. M. Adams	Secretary, R. B. Townsend
Everett	Everett
Spokane County Society	2nd and 4th Thursdays—Spokane
President, W. J. Pennock	Secretary, D. A. Palmer
Spokane	Spokane
Stevens County Society	
President, W. H. Gray	Secretary, R. S. Wells
Colville	Colville
Thurston-Mason Counties Society	
President, E. B. Londin	Secretary, J. L. Paine
Olympia	Olympia
Walla Walla Valley Society	2nd Thursday—Walla Walla
President, F. M. Campbell	Secretary, G. C. Daniels
Walla Walla	Walla Walla
Whatcom County Society	First Monday—Bellingham
President, L. P. McCalla	Secretary, John McGregor
Bellingham	Bellingham
Whitman County Society	
President, A. T. Lukins	Secretary, P. G. Weisman
La Crosse	Colfax
Yakima County Society	First and Third Mondays—Yakima
President, Kay England	Secretary, Ralph Shirey
Yakima	Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology	
President, W. F. Hoffman	Secretary, F. A. Brugman
Seattle	Seattle

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President, D. E. Cornwall	Secretary, H. W. Stone
St. Maries	Boise
Oregon State Medical Society	Oct. 22-24, 1931—Eugene
President, T. E. Griffith	Secretary, F. D. Stricker
The Dalles	Portland
Washington State Medical Assn.	Aug. 3-5, 1931—Aberdeen
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Aberdeen	Seattle
University of Wash. Extension Course	July 13-17, 1931—Seattle
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President, E. D. Kanaga	Secretary, H. T. Clay
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Los Angeles	Seattle
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President, F. P. Patterson	Secretary, Chas. McClure
Vancouver, B. C.	Portland, Ore.
Med. Soc. of the State of California	April 27-30, 1931—San Francisco

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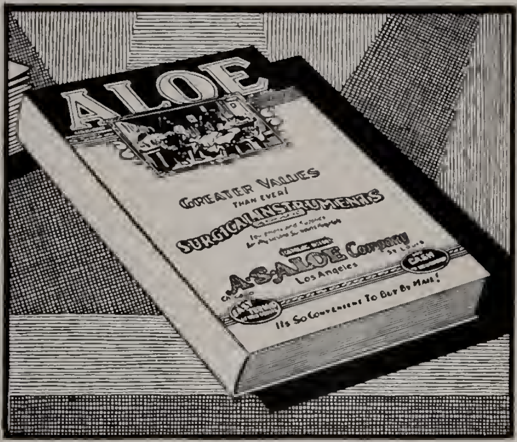

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GERMICIDAL AND THERAPEUTIC APPLICATIONS OF SOAPS. According to John E. Walker, Opelika, Ala. (*Journal A. M. A.*, July 4, 1931), soaps are strongly bactericidal against pneumococci, streptococci, meningococci, gonococci, diphtheria bacilli, influenza bacilli and *Spirochaeta pallida*. Their activity against these organisms compares favorably with that of many of the recently synthesized chemicals.

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Society	Meetings	President	Secretary
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Canyon County Society		President, S. B. Dudley Caldwell	Secretary, T. C. Horton Nampa
Idaho Falls Medical Society		President, C. M. Cline Idaho Falls	Secretary, A. R. Soderquist Idaho Falls
Kootenai County Society		President, E. L. Spohn Coeur d'Alene	Secretary, J. T. Wood Coeur d'Alene
Nez Perce County Society		President, L. B. Stockslager Lewiston	Secretary, P. G. Haury Lewiston
Pocatello Medical Society	First Thursday—Pocatello	President, D. C. Ray Pocatello	Secretary, W. F. Howard Pocatello
Shoshone County Society		President, G. H. Kennett Kellogg	Secretary, J. R. Bean Wallace
Southwestern Idaho Society		President, G. H. Wahle Boise	Secretary, O. F. Swindell Boise
South Side Society		President, H. W. Clouchek Twin Falls	Secretary, H. N. Leete Twin Falls
Tri-County Society (Latah, Benewah, Clearwater)		President, J. H. Einhouse Moscow	Secretary, O. M. Husted Elk River
Upper Snake River Society		President, L. A. Rich Rexburg	Secretary, Clamor Gavin Rigby

OREGON

Society	Meetings	President	Secretary
Benton County Society		President, W. T. Johnson Corvallis	Secretary, Henry Garnjobst Salem
Central Willamette Society		President, D. C. Stanard Eugene	Secretary, Henry Garnjobst Corvallis
Central Oregon Society		President, B. F. Ferrell Bend	Secretary, J. W. Thom Bend
Clatsop County Society		President, G. S. Morgan Astoria	Secretary, Joseph McConnell Astoria
Coos-Curry Counties Society		President, R. H. Mast Myrtle Point	Secretary, J. M. Simpkin Marshfield
Douglas County Society		President, A. C. Seely Roseburg	Secretary, J. C. Twitchell Roseburg
Eastern Oregon District Society		President, J. P. Brennan Pendleton	Secretary, Lewa Wilkes La Grande
Jackson County Society		President, G. W. Gregg Ashland	Secretary, E. W. Shockley Medford
Klamath and Lake Counties Society		President, R. W. Stearns Klamath Falls	Secretary, Harold Brown Klamath Falls
Lane County Society		President, O. A. Waller Eugene	Secretary, H. G. Talbot Eugene
Mid-Columbia Society		President, M. Thrane Hood River	Secretary, C. C. Chick Hood River
Polk-Marion Counties Society	First Tuesday	President, R. L. Wood Salem	Secretary, W. W. Baum Salem
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Southern Oregon Medical Society	Grants Pass	President, B. R. Shoemaker Roseburg	Secretary, E. A. Woods Ashland
Tillamook County Society		President, M. R. Charlton Tillamook	Secretary, David Robinson Tillamook
Yamhill County Society		President, J. G. Manning McMinnville	Secretary, Zilpha Galloway McMinnville
Oregon Ophthalmological and Oto-Laryngological Society	Third Tuesday—Good Samaritan Hospital	President, J. L. McCool Portland	Secretary, A. J. Browning Portland

WASHINGTON

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Cowlitz County Society		President, John Barton Longview	Secretary, A. F. Birbeck Longview
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Klickitat-Skamania Counties Society		President, J. L. Harris Stevenson	Secretary, W. C. Trowbridge Goldendale
Lewis County Society	Second Monday—Centralia and Chehalis	President, H. B. Cravens Pe Ell	Secretary, Rush Banks Centralia
Lincoln County Society		President, Glen Snyder Odessa	Secretary, C. S. Baumgarner Davenport
Pacific County Society	Third Saturday—Raymond and South Bend	President, O. R. Nevitt Raymond	Secretary, G. A. Tripp South Bend
Pierce County Society	Second and Fourth Tuesdays—Tacoma	President, Ralph Schaeffer Tacoma	Secretary, W. B. Penney Tacoma
Skagit County Society		President, George Crabtree Mt. Vernon	Secretary, W. N. Hunt Burlington
Snohomish County Society	First Tuesday—Everett	President, E. M. Adams Everett	Secretary, W. F. West, Jr. Everett
Spokane County Society	2nd and 4th Thursdays—Spokane	President, W. J. Pennock Spokane	Secretary, D. A. Palmer Spokane
Stevens County Society		President, H. F. Craig Marcus	Secretary, W. H. Gray Colville
Thurston-Mason Counties Society		President, E. B. Londin Olympia	Secretary, J. L. Paine Olympia
Walla Walla Valley Society	2nd Thursday—Walla Walla	President, F. M. Campbell Walla Walla	Secretary, G. C. Daniels Walla Walla
Whatcom County Society	First Monday—Bellingham	President, L. P. McCalla Bellingham	Secretary, John McGregor Bellingham
Whitman County Society		President, A. T. Lukins La Crosse	Secretary, P. G. Weisman Colfax
Yakima County Society	First and Third Mondays—Yakima	President, Kay England Yakima	Secretary, Ralph Shirey Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology		President, W. F. Hoffman Seattle	Secretary, F. A. Brugman Seattle

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Med. Soc. of the State of California	April 27-30, 1931—San Francisco		

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WASHINGTON FOUGHT ILL HEALTH DURING ENTIRE LIFETIME

Despite the fact that George Washington came through history pictured as a stalwart figure, a careful survey of old documents shows that he had a struggle to keep himself healthy enough to do the great amount of work that he accomplished during his lifetime, relates James Hay, Jr., in "George Washington's Conquest of Physical Handicaps" in *Hygeia, the Health Magazine*.

It is safe to assume, says Mr. Hay, that if Washington had not lived in the open air and exercised the greatest care and moderation in eating, his life span would have been far shorter.

Washington suffered repeated attacks of fever. At one time while on the Braddock Expedition against the French he had to be left along the road to await another detachment because he was too ill to travel. Shortly after he was elected president he was ill with a malignant carbuncle and it seemed for a time that the condition was incurable.

Washington's hearing had partially failed him in later years, and he wore glasses after middle life. In his twenty-ninth year he had a number of defective teeth and when he was 57 he was using many false teeth.

HOW TO CORRECT DIARRHEA

After a starvation period of twelve to twenty-four hours on boiled water or gelatin water (1/3 oz. of gelatin to one pint of boiled water), the infant should be given Protein S. M. A. (Acidulated) diluted 4 level tablespoons with 9 ounces of water, and without any additional carbohydrate.

	1st Day	2nd Day	3rd Day*
Severe cases	3 oz.	6 oz.	9 o.z
Medium cases	10 oz.	15 oz.	20 oz.
Mild cases	15 oz.	30 oz.	

* Until the proper amount for their age and condition is reached, which is 200 cc. per kilo of body weight per twenty-four hours, or three ounces per pound of body weight per twenty-four hours. However, the total twenty-four hour intake need not go above thirty-two to thirty-five oz. or 960 to 1050 cc.

After 48 hours or when the stools become normal, SMACO (400) Maltose and Dextrins (Spray Dried) should be added gradually, beginning with one oz. to the quart, and increasing until the infant is gaining steadily in weight. In certain cases, it may be necessary to increase the carbohydrate to a total of 12 to 15% (3 to 4 oz. of carbohydrate to the quart).

SEWING NEEDLE IS CAUSE OF MANY HOME ACCIDENTS—FRAGMENTS IN BODY RARELY TRAVEL

People have an unwarranted fear of hypodermic needles breaking in the body, while they do not often regard the everyday sewing needle with alarm. The sewing needle is the cause of numerous household accidents. Few other small accidents cause so much distress and worry as the needle accident, comments Dr. Victor W. Eisenstein in *Hygeia*. There is always the fear that the needle particle will travel in the body and do harm.

As a rule such accidents do not endanger life. A few authentic cases of the movement of needles in the body have been reported in medical literature. But bona-fide instances of far-flung migrations are hard to find, asserts Dr. Eisenstein. In the majority of cases needle fragments in the body are remarkably well behaved and give little serious indication for their removal. The motion that occurs is caused by the contraction of the muscles.

Such accidents annoy the physician because of the difficulty of removing a needle fragment. One doctor has remarked that he would rather look for a needle in a hay stack than for its mate in the flesh. Devices are being used today, however, that will help to locate the needle. One method magnetizes the fragment and seeks for it with another needle.

Make the home a safe place in which to live by following a few simple rules in regard to needles, advises this doctor:

Sew only in a light room and in a comfortable position.

Keep needles in a definite place. When a needle is not in use, keep it threaded to insure its detection if lost.

Keep fingers well away from the needles in sewing machines.

Use a thimble.

Inspect garments that have been repaired before wearing or washing.

Wear shoes or slippers about the house.

Look where you search; don't poke blindly in littered drawers or bags.

Keep one needle at a time in the work basket; keep all others out of the way.

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MEDICAL DIRECTOR FINDS CHILD'S DEFECTS

The school is aiding the parent more and more in procuring health for children, comments Dr. Emily A. Pratt in *Hygeia*. Parents usually assume responsibility of caring for their children's health to the best of their ability, but when their knowledge prevents a complete understanding, it is the duty of the school to help them, believes Dr. Pratt. Many times, the school doctor and the teacher are in a position to recognize symptoms of eyestrain and deafness that parents do not notice.

The laws of some states require the employment of a school medical superintendent who is a physician. His function is to conduct a health protective service. This medical service is providing in many schools yearly tests of vision and hearing which are conducted by the school authorities under the direction of the medical inspector.

After the defects in hearing or sight are found at school a report is made to the parents whose duty it is to see that the child is taken to the proper specialist for treatment. At this time, the parents assume the responsibility and the entire life of the child may depend on the parent's response to the notice sent from the school.

The family physician knows best which specialist to select for the eyes and which for the ears, says Dr. Pratt. He knows which hospital offers the best service. It was the family doctor who had the care of the child before he started to school and he can best advise the methods for the correction of the child's eyesight or hearing.

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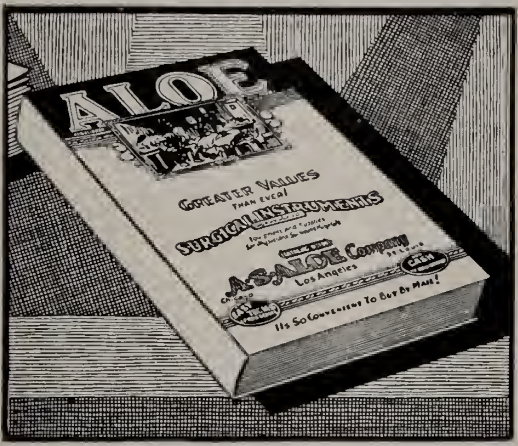

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MILK ALLERGY BOOKLET

Allergy is a subject that is earning greater attention from physicians these days because it appears that a number of obscure ailments may be traced to allergic conditions. Food allergy particularly is coming in for attention, since even a partial list of the manifestations of food allergy reads like a patent medicine advertisement.

Because milk is so widely used as a food, milk allergy was deemed of sufficient importance to S. M. A. Corporation for them to prepare a twenty-two page pamphlet on the subject which they are offering without charge to physicians who write for it. Quotations from authorities on the subject of allergy make up most of the material. At the back is a list of references to forty-two books and papers. This alone is interesting to any physician who wants to read up on the subject, regardles of how well informed he may be.

The pamphlet takes up such subjects as: what milk allergy is, allergic manifestations, incidence and diagnosis of food allergy, value and technic of skin tests, elimination diets, feeding suggestions, SMACO Non-Allergic Milks, etc., and makes clear that not all allergies are caused by milk and that not all food allergies are milk allergies.

This booklet is offered free of charge to physicians who will write the S. M. A. Corporation at Cleveland, Ohio, asking for it. SMA and SMACO products are not advertised to the public and carry on the label the statement that they are to be used only under the direction of a licensed physician.

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IDAHO

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President, C. M. Cline	Secretary, A. R. Soderquist
Idaho Falls	Idaho Falls
Kootenai County Society	
President, E. L. Spohn	Secretary, J. T. Wood
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Nez Perce County Society	
President, L. B. Stockslager	Secretary, P. G. Haury
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President, C. F. Schietz	Secretary, W. F. Howard
Pocatello	Pocatello
Shoshone County Society	
President, G. H. Kennett	Secretary, J. R. Bean
Kellogg	Wallace
Southwestern Idaho Society	
President, G. H. Wahle	Secretary, O. F. Swindell
Boise	Boise
South Side Society	
President, H. W. Clouchek	Secretary, H. N. Leete
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Moscow	Elk River
Upper Snake River Society	
President, L. A. Rich	Secretary, Clamor Gavin
Rexhurg	Righy

OREGON

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President, D. C. Stanard	Secretary, Henry Garnjohst
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Central Oregon Society	
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President, G. S. Morgan	Secretary, Joseph McConnell
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Coos-Curry Counties Society	
President, R. H. Mast	Secretary, J. M. Simpkin
Myrtle Point	Marshfield
Douglas County Society	
President, A. C. Seely	Secretary, J. C. Twitchell
Rosehurg	Rosehurg
Eastern Oregon District Society	
President, C. C. Gordon	Secretary, J. J. D. Haun
Baker	La Grande
Jackson County Society	
President, G. W. Gregg	Secretary, E. W. Shockley
Ashland	Medford
Klamath and Lake Counties Society	
President, R. W. Stearns	Secretary, Harold Brown
Klamath Falls	Klamath Falls
Lane County Society	
President, O. A. Waller	Secretary, H. G. Talhot
Eugene	Eugene
Mid-Columbia Society	
President, M. Thrane	Secretary, C. C. Chick
Hood River	Hood River
Polk-Marion Counties Society	First Tuesday
President, R. L. Wood	Secretary, W. W. Baum
Salem	Salem
Portland City and County Society	
President, N. W. Jones	Secretary, H. P. Rush
Portland	Portland
Southern Oregon Medical Society	Grants Pass
President, B. R. Shoemaker	Secretary, E. A. Woods
Rosehurg	Ashland
Tillamook County Society	
President, M. R. Charlton	Secretary, David Robinson
Tillamook	Tillamook
Yamhill County Society	
President, J. G. Manning	Secretary, Zilpha Galloway
McMinnville	McMinnville
Oregon Ophthalmological and Oto-Laryngological Society	Third Tuesday—Good Samaritan Hospital
President, J. L. McCool	Secretary, A. J. Browning
Portland	Portland

WASHINGTON

Chelan County Society	
President, R. T. Congdon	Secretary, A. G. Young
Wenatchee	Wenatchee
Clallam County Society	3rd Tuesday—Port Angeles and Sequim
President, R. S. Hamilton	Secretary, W. H. Taylor
Port Angeles	Port Angeles
Clark County Society	Second Tuesday—Vancouver
President, A. E. Bird	Secretary, J. A. Darhy
Camas	Kalama
Cowlitz County Society	
President, John Barton	Secretary, A. F. Birheck
Longview	Longview
Grays Harbor County Society	
President, E. B. Riley	Secretary, L. R. Lightfoot
Aherdeen	Aherdeen
Jefferson County Society	
President, J. F. Delaney	Secretary, H. C. Miller
Port Townsend	Port Townsend
King County Society	First Four Mondays—Seattle
President, R. J. McCurdy	Secretary, A. J. Bowles
Seattle	Seattle
Klickitat-Skamania Counties Society	
President, J. L. Harris	Secretary, W. C. Trowbridge
Stevenson	Goldendale
Lewis County Society	Second Monday—Centralia and Chehalis
President, H. B. Cravens	Secretary, Rush Banks
Pe Ell	Centralia
Lincoln County Society	
President, Glen Snyder	Secretary, C. S. Baumgarner
Odessa	Davenport
Pacific County Society	Third Saturday—Raymond and South Bend
President, O. R. Nevitt	Secretary, G. A. Tripp
Raymond	South Bend
Pierce County Society	Second and Fourth Tuesdays—Tacoma
President, Ralph Schaeffer	Secretary, W. B. Penney
Tacoma	Tacoma
Skagit County Society	
President, George Crahtree	Secretary, W. N. Hunt
Mt. Vernon	Burlington
Snohomish County Society	First Tuesday—Everett
President, E. M. Adams	Secretary, W. F. West, Jr.
Everett	Everett
Spokane County Society	2nd and 4th Thursdays—Spokane
President, W. J. Pennock	Secretary, D. A. Palmer
Spokane	Spokane
Stevens County Society	
President, H. F. Craig	Secretary, W. H. Gray
Marcus	Colville
Thurston-Mason Counties Society	
President, E. B. Londin	Secretary, J. L. Paine
Olympia	Olympia
Walla Walla Valley Society	2nd Thursday—Walla Walla
President, F. M. Campbell	Secretary, G. C. Daniels
Walla Walla	Walla Walla
Whatcom County Society	First Monday—Bellingham
President, L. P. McCalla	Secretary, John McGregor
Bellingham	Bellingham
Whitman County Society	
President. A. T. Lukins	Secretary, P. G. Weisman
La Crosse	Colfax
Yakima County Society	First and Third Mondays—Yakima
President, Kay England	Secretary, Ralph Shirey
Yakima	Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology	
President, W. F. Hoffman	Secretary, F. A. Brugman
Seattle	Seattle

ANNUAL MEETINGS OF MEDICAL SOCIETIES

NAME	Meetings Held
American Medical Assn.	June 8-12, 1931—Philadelphia, Pa.
Pacific Northwest Medical Association	June 25-27, 1931—Seattle
President, G. W. Swift	Secretary, Frederick Epplen
Seattle, Wash.	Seattle, Wash.
Idaho State Medical Assn.	Sept. 29-30, 1931—Boise
President, D. E. Cornwall	Secretary, H. W. Stone
St. Maries	Boise
Oregon State Medical Society	Oct. 22-24, 1931—Eugene
President, T. E. Griffith	Secretary, F. D. Stricker
The Dalles	Portland
Washington State Medical Assn.	Aug. 3-5, 1931—Aberdsen
President, A. E. Anderson	Secretary, C. H. Thomson
Aberdeen	Seattle
University of Wash. Extension Course	July 13-17, 1931—Seattle
North Pacific Pediatric Society	June 23, 1931—Vancouver, B. C.
President, E. D. Kanaga	Secretary, H. T. Clay
Tacoma	Tacoma
Pacific Coast Oto-Ophthalmological Society	May 28-30, 1931—Los Angeles
President, Chester Bower	Secretary, W. F. Hoffman
Los Angeles	Seattle
Pacific Northwest Orthopedic Assn.	Sept. 5, 1931—Vancouver, B. C.
President, F. P. Patterson	Secretary, Chas. McClure
Vancouver, B. C.	Portland, Ore.
Med. Soc. of the State of California	April 27-30, 1931—San Francisco

Corrections and additions to this list are requested from the societies represented.

PROFESSIONAL ANNOUNCEMENTS

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A physician is wanted to develop a salt water health resort between Seattle and Tacoma. Have ideal location. Nothing like it in the Northwest. Will attract people from all over the United States. Only physician with highest professional and business standing will be considered. Address M., care Northwest Medicine, Seattle.

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Thoroughly equipped office for sale for eye, ear, nose and throat work, with practice of ten years standing. In one of best cities of Oregon. This is for sale at about one quarter the price of equipment. Owner retiring. Address P, care Northwest Medicine, Seattle.

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Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nationwide connections enable us to give superior service. Aznoe's National Physicians Exchange, 30 North Michigan Chicago. Established 1896. Member The Chicago Association of Commerce.

"WHEN, AS AND IF—"

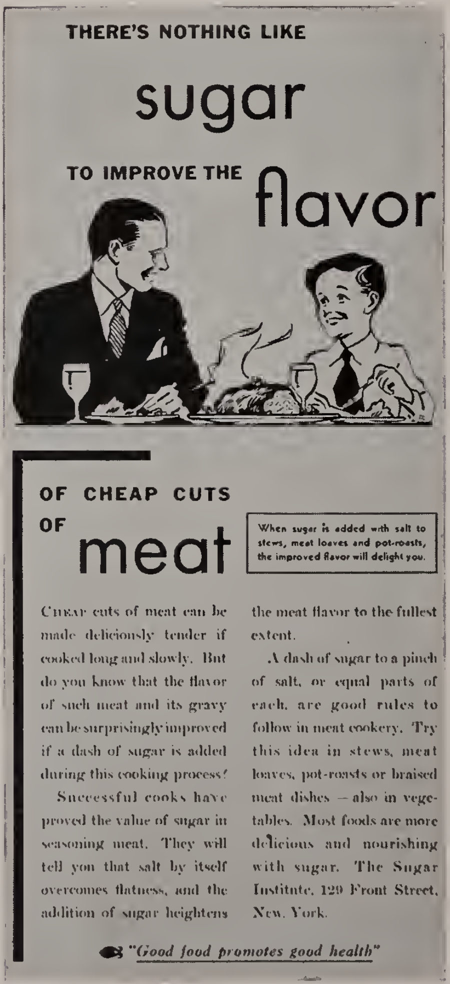
the bottle fed baby exhibits symptoms indicating partial vitamin B deficiency—described by Hoobler as (1) anorexia, (2) loss of weight, (3) spasticity of arms and legs, (4) restlessness, fretfulness, (2) pallor, low hemoglobin, etc.—Dextri-Maltose with vitamin B may be used in adequate amounts (up to 71 Chick-Roscoe units) without causing digestive disturbance. This ethically advertised product derives its vitamin B complex from an extract of wheat germ rich in B and brewer's yeast rich in G. Physicians who have attempted to make vitamin B additions to the infant's formula but who have been obliged to abandon same due to diarrheas or other unfortunate nutritional upsets, will welcome Mead's Dextri-Maltose with vitamin B. This is a tested product with rich laboratory and clinical background and is made by Mead Johnson & Company, a house specializing in infant diet materials. Not all infants require vitamin B supplements, but when the infant needs additional vitamin B, this product supplies it to gether with carbohydrate. In other cases, the carbohydrate of choice is Dextri-Maltose No. 1, 2 or 3.

Etiologic Study of Series of Optic Neuropathies. Alan C. Woods and William M. Rowland, Baltimore (*Journal A. M. A.*, Aug. 8, 1913), present a series of 138 patients with optic neuropathies, most of whom were admitted to the wards of the Johns Hopkins Hospital in various services. Of these cases, 27.7 per cent were due to actual intracranial tumor; 5.1 per cent were due to pseudo-arteriosclerosis; 8.1 per cent were due to posterior sinus disease; 6.5 per cent were due to multiple sclerosis; 2.9 per cent were due to focal infection; 4.4 per cent were due to toxic amblyopia; 9.1 per cent were due to miscellaneous conditions, while in 8.1 per cent the exact etiologic factors could not be determined.

Here

is one of the advertisements of The Sugar Institute

The advertisement reproduced here is one of the series appearing in publications throughout the country. In order to keep the statements in accord with modern medical practice, they have been submitted to and approved by some of the leading authorities in the field of human nutrition in the United States. The Sugar Institute, 129 Front Street, New York.



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TO IMPROVE THE flavor

OF CHEAP CUTS OF meat

When sugar is added with salt to stews, meat loaves and pot-roasts, the improved flavor will delight you.

Cheap cuts of meat can be made deliciously tender if cooked long and slowly. But do you know that the flavor of such meat and its gravy can be surprisingly improved if a dash of sugar is added during this cooking process?

Successful cooks have proved the value of sugar in seasoning meat. They will tell you that salt by itself overcomes flatness, and the addition of sugar heightens the meat flavor to the fullest extent.

A dash of sugar to a pinch of salt, or equal parts of each, are good rules to follow in meat cookery. Try this idea in stews, meat loaves, pot-roasts or braised meat dishes — also in vegetables. Most foods are more delicious and nourishing with sugar. The Sugar Institute, 129 Front Street, New York.

"*Good food promotes good health*"

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INTERNATIONAL UNION AGAINST TUBERCULOSIS

The annual meeting of the Council of the International Union against Tuberculosis, whose Chairman is Prof. Frölich (Norway), was held in Paris on Thursday, July 9th; delegates from seventeen countries attending this meeting. At 10 a. m. an administrative session took place at the headquarters of the Union, 2 Avenue Vélasquez, Paris. It was decided that the next Conference of the International Union would be held at The Hague from September 6th to 9th, 1932, and that the three following subjects, selected from a list of questions submitted by the various countries belonging to the Union, would be inscribed on the agenda: Biological subject: *"The relationship between allergy and immunity;* the opening report will be read by a person to be designated later; Clinical subject: *Gold-therapy,* opening report by Prof. Sayé (Barcelona); Social subject: *After-Care Schemes for the Tuberculous,* opening report by Dr. B. H. Vos (Hellendoorn). According to the method adopted at the Oslo Conference ten speakers, selected from different countries, will be designated to open the discussion on each of the three main subjects.

The scientific session was held at the Pasteur Institute, in the new tuberculosis laboratories which the members of the Council visited under the guidance of Prof. Calmette. The meeting was devoted to the report of Dr. Soper (United States) on "A Standard Anti-Tuberculosis Plan"; in Dr. Soper's absence his report was read by Prof. Opie (United States). Prof. Valtis (Greece) then explained the steps taken in regard to the anti-tuberculosis campaign in his country. These reports were followed by a discussion in which Prof. Léon Bernard, Secretary General of the Union, Prof. Knud Faber (Denmark), Colonel Rudzki (Poland), and others took part.

The National Tuberculosis Association, 450 Seventh Avenue, New York City, is planning a special party to The Hague Conference, sailing on the *S.S. Westernland,* August 26, 1932, at low rates for the round trip. A circular regarding the Conference and plans for the party may be secured from the Association.

LET'S DO OUR PART IN A WORTHY CAUSE

In these days of general business depression, when the immediate need must be met, we have a tendency, unhappily, in responding to the emergency, to overlook other less spectacular but absolutely essential charities. Yet the suffering of hard times are many fold increased when serious or fatal illness occurs. Too often the family is broken up as the result of illness which might have been avoided; and the situation is then indeed tragic.

With insufficient funds the agencies in the field of health education are trying to meet present conditions, to respond to demands even heavier than in normal times, and to carry on so that the ground already won shall not be lost. The New York City Cancer Committee of the American Society for the Control of Cancer, one of these agencies, supported entirely by public subscription, calls attention to the increased need for cancer education during the depression, when so many who lack funds are apt to neglect their health, disregard warning signs, and trust to luck. Particularly in the case of cancer is delay dangerous and early examination and treatment imperatively necessary, since in early treatment lies the only hope of escape. It is gratifying to be assured that as a result of public education in cancer during the past few years, patients suffering from the disease are coming to physicians at earlier stages in its development, when there is chance of cure. This is due largely to the work of the Society, and is a most helpful advance.

The financing of such work is always a task, and in times of depression a much more difficult one. To secure funds necessary for carrying on its campaign throughout the year, and for responding to the resulting appeals for help for advice in the particular case, and for information in general, the New York City Cancer Committee of the American Society for the Control of Cancer has put out an address label which carries the emblem of its work, a sword entwined with the healing symbol, typifying the fight for humanity against disease. The use of these strikingly effective labels, an ornament to the Christmas package, indicates endorsement of the work and participation in it. They are sold in lots of ten for one dollar, all the proceeds going to the Committee.

Those who are in touch with the situation tell us that the need is great, and no one who has seen anything of the ravages of cancer in its later stages can doubt that this is so. The work of cancer education must go on, and the response to the appeal for funds to continue it should be generous.

Labels can be ordered by mail, in any quantity, from the New York City Cancer Committee, 34 East 75th Street, New York.

GOITER CLASSIFICATION AND NOMENCLATURE

The American Association for the Study of Goiter desires to give publicity to its approval of the following classification and nomenclature for cases of goiter:

CLINICAL CLASSIFICATION

Type 1. Non-toxic diffuse goiter
Type 2. Toxic diffuse goiter
Type 3. Non-toxic nodular goiter
Type 4. Toxic nodular goiter

NOMENCLATURE

The association advocates a policy of using the simplest and yet the most descriptive terminology possible.

The use of proper names, while it is impossible to dispense with many well established ones in goiter literature, should be discouraged, as should coined words invented to popularize a fad or a fancy.

Emphasis should be made upon the importance of not confounding varieties and sequelae with types. The use of such terms as exophthalmic, hemorrhagic, cystic, adolescent, colloid, intrathoracic, substernal and congenital are perfectly proper when used to describe varieties, but only constant characteristics should be used to designate types.

TYPHOID FEVER*

The marked reduction in the prevalence of typhoid fever throughout the United States has been one of the outstanding accomplishments in public health during the past quarter of a century. This has been accomplished in cities whose sources of public water supply are grossly polluted, largely by the intelligent installation of approved water purification plants. However, although the purified public drinking water meets the accepted sanitary standards, there often persists in such cities a small number of cases of typhoid fever. This fact stimulated the United States Public Health Service to undertake an extensive study of these persisting or residual cases of typhoid fever, the object being to determine if they could bear any relation to the municipal drinking water, even though it did meet the present rigid sanitary standards.

Six cities situated on the Ohio River were selected for study, both because of the polluted character of their raw water supplies and because of the excellence of their municipal water purification plants. The Ohio River is the source of the public water supply for each city. During the period of raw water consumption, the typhoid fever incidence in each city was uniformly very high in every month of the year, a seasonal distribution which is typical of endemic water-borne typhoid fever. Following the installation of the present public water supplies, the typhoid incidence promptly fell to a low rate, comparable with rates prevailing in other cities on the Ohio River watershed which have had, at least since 1914, safe water supplies. At the same time, the seasonal distribution changed so as to give a definitely summer and fall disease.

Ample evidence did accumulate to indicate that routes of transmission of typhoid fever other than the public water supply were in all probability the more usual. Therefore, the conclusion was reached from the evidence collected that modern water purification plants, such as are in operation in the six cities studied, when properly operated and controlled, effectively eliminate the danger of contracting typhoid fever from the public drinking water, even though the raw water supply be grossly polluted.

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*Health News, U. S. Public Health Service, Sept. 9, 1931.

FISH-POISON PLANTS MAY PRODUCE IDEAL INSECTICIDE*

The ideal insect poison, one deadly to insects but harmless to humans and animals, has for years been the object of scientific research. Now there is promise of success, insect-fighters of the U. S. Department of Agriculture believe. The fact that some entomologists are convinced that insects are gradually developing resistance to the poisons now used against them has stimulated the scientists to redouble their efforts.

The most recently developed poison is rotenone. The department scientists have been studying it for the last three years. This poison occurs in the roots of several tropical plants, especially in "cube" (pronounced coo-bay) in South America and derris in the East Indies. Scientists turned to these plants when they learned that the natives use them in fishing. The natives prepare an extract from one of these roots and pour it into a stream. Even with such a wholesale dilution the fish become intoxicated or stupefied. The primitive fishermen then gather them in. The fact that these fish are not poisonous to the natives led scientists to believe that here might be a poison effective as an insecticide and at the same time harmless to man.

Though rotenone has a rapid and certain effect on fish, experiments have shown that it is harmless to warm-blooded animals when taken by mouth. A department scientist was so sure of the harmlessness of the powder that he took a quantity of it in a capsule and suffered no ill effects. This is its great advantage as an insecticide for fruit pests. In some instances foreign buyers of American fruit have discriminated against fruits, especially apples, which have been sprayed with arsenical insecticides. The new poison, rotenone, promises to remove cause for this prejudice.

The search for plants with insecticidal properties has been world wide. Dr. R. C. Roark, principal chemist in charge of the insecticide division of the Bureau of Chemistry and Soils, U. S. Department of Agriculture, recently compiled excerpts from U. S. consular correspondence relating to insecticidal and fish-poison plants. Consuls in all tropical countries were asked to be on the watch for fish-poison plants and others believed to have insecticidal properties. Their reports indicate that in every tropical country there are many of these fish-poison plants. Most of the research has related to cube and derris roots, but the wide use of other fish poisons in the tropics indicates a field rich for investigation.

The rotenone poison research has been going on for three years, chiefly to answer two questions: Can the raw material be grown commercially and abundantly, either in the tropics of foreign countries or in our own territory or possessions? Can the poison be made synthetically? It is not definitely known whether it can be produced synthetically and on a commercially profitable scale, but some progress has been made in this direction. It is an interesting fact, the scientists point out, that the natives of widely separated parts of the world have, independently of each other, discovered these fish poisons with the same chemical characteristics. The South American natives use cube. In the Malay states derris is used, and the natives of the African Congo use other poison roots. Rotenone approaches the ideal insecticide because it not only kills insects that eat leaves or fruit sprayed with it, but it also kills if it is sprayed on them. It is both a stomach poison and a contact poison. Rotenone promises to come into wide use. With the pioneer work of investigation already done, at least two companies in the United States are now manufacturing it on a commercial scale. It seems probable that the first principal use will be in household insect powders. Rotenone is also the basis for some animal powders, such as flea dust.

Perhaps the largest potential uses of rotenone are as a contact poison against plant lice and as a spray against fruit insects. There appears to be an unlimited supply of raw material for the making of rotenone. Dr. Roark reports that cube is found in practically all parts of the upper Amazon basin in South America. Derris root is now being cultivated in the East Indies. Although cube grows wild, there is no reason why it should not be cultivated, Dr. Roark says.

Although research has been concentrated largely upon rotenone and the tropical raw materials from which it can be extracted, the department specialists are also making a wide study of native plants of the United States in the hope of finding some which have insecticidal properties. A number of leads have been discovered and some of these promise to be valuable. The department chemists are also seeking a source of supply for rotenone in plants which can be raised in the United States, thus keeping the nation independent of any other country for its supply. It is believed that cube may be grown in Porto Rico, the Philippines and, possibly, in the Virgin Islands and the southernmost parts of the United States. Experiments to determine the feasibility of this are under way.

The cultivation of derris in the East Indies fits in well with rubber growing. Rubber trees are planted about 30 feet apart. Derris is a small shrub and is planted between the rows of rubber trees.

As yet, rotenone costs more per pound in the concentrated powder form than other ordinary insect poisons, but its greater effectiveness against some insects makes the cost of spraying with it less than with other treatments. With further development of the raw materials, there is likelihood that the poison may be produced at a fairly low cost.

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* U. S. Department of Agriculture, July 21, 1931.

Deficiency in Present-day Education. A. C. Ivy, Chicago (*Journal A. M. A.*, Aug. 29, 1931), states that it is being recognized more and more that education by dictation is not a success. Educators are beginning to recognize that one learns effectively only by doing. The scientific method of doing, of learning by experimentation, the method by which science grows, is being introduced into secondary and primary education in the best school systems, and the courses in the curriculum that can be taught only by dictation are losing their former hold on the educational process. This movement should be encouraged. The child and the youth should be encouraged, in spite of the additional labor on the part of the teacher and the additional expense involved, to answer questions by searching for them by experiments, so that the scientific method may become more of an automatic cerebral process. However, the introduction of the scientific method into the educational system per se will not develop a true regard for the human body, the most wonderful creation, or a true regard for the facts of medical science, and will not meet what appears to be an outstanding deficiency in present-day formal eduction. The only method for accomplishing this aim is to introduce the study of biology and human anatomy and physiology into the curriculum of primary and secondary schools on a par with the "three R's." It is true that a little nature study has been introduced into the grammar grades of some of the best public schools and that a fair course in botany, zoology, physics and chemistry is offered in numerous high schools; but it is exceedingly rare to find a high school in which a good course in anatomy and physiology by a trained teacher is offered. In all high schools there are teachers with special training in Latin, history and modern languages but not in human anatomy and physiology.

The present attempt at health education in the public schools is a highly laudable enterprise, to be encouraged, but as a rule is a feeble effort made by teachers who know very little anatomy and physiology, as a result of their own deficient education. Even colleges and universities turn out graduates who for the most part know relatively nothing about the human body. If health is one's greatest wealth and asset, if the human body and mind are the most wonderful creations, certainly an educated person should possess a working knowledge of human anatomy and physiology, and training in the knowledge of the human body should be equal to that received in English, history and arithmetic, or it should at least be given a significant and effective place in the curriculum and taught by teachers who have had some special training in the subject.

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One of the shortcomings of this country as compared with Europe is that people are not trained for an avocation, Dr. Charles H. Mayo states in a *Hygeia* article. When a man quits work he does not know what to do with his time and old age becomes irksome. Dr. Mayo's suggestion is for everyone to grow old gracefully by developing along the way a hobby or two.

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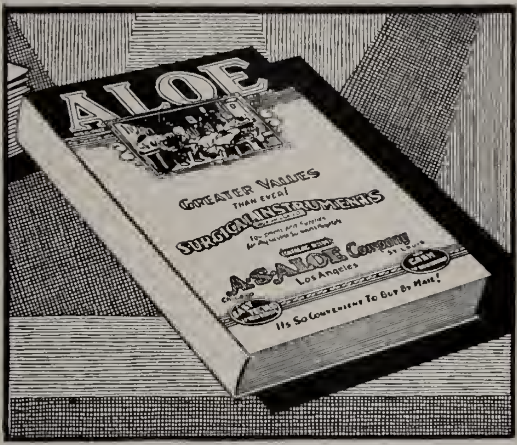

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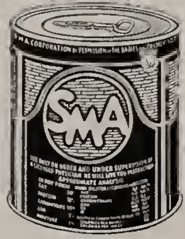

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BUDDHA LIVED CHIEFLY ON MILK

Milk has been the main part of the diet of many famous people. Thomas Edison, who subsists on little else, stands in the foreground among the milk drinkers as does Colonel Lindbergh, who asked first for a glass of milk as soon as he arrived safely in France after his lone ocean flight.

James A. Tobey gives the story of other milk drinkers in an article entitled "Famous Milk Addicts" in the October number of *Hygeia*. There were Romulus and Remus, the Roman twins who were said to have been suckled by a she-wolf. Buddha lived chiefly on milk. Jack Dempsey, Gene Tunney and Max Schmeling all drink large quantities of milk.

In days gone by, not only the milk of the cow and the goat was added to the human diet but also the milk of the ass and the mare. When Marco Polo visited the court of Kublai Kahn in the thirteenth century, reports Mr. Tobey, he was amazed to find a stable full of white mares whose milk was used to supply the Khan and his family. In the fifteenth century when King Francis I was ill, a Jewish doctor from Constantinople prescribed asses' milk and he promptly recovered.

"Because of its bulk, deficiency in iron, and comparatively low content of one or two of the vitamins, milk must be classed as the most nearly perfect food and not the perfect food; it is one of the best sources of certain valuable fats, carbohydrates, proteins, minerals and also the extremely important vitamins A and G," declares Mr. Tobey. More than 56 gallons per person a year of milk is consumed in this country, which averages about a half a quart a day for each person.

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Mid-Columbia Society		President, De Walt Payne The Dalles	Secretary, Grace Young The Dalles
Polk-Marion Counties Society	First Tuesday	President, R. L. Wood Salem	Secretary, W. W. Baum Salem
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Cowlitz County Society		President, John Barton Longview	Secretary, A. F. Birbeck Longview
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King County Society	First Four Mondays—Seattle	President, R. J. McCurdy Seattle	Secretary, A. J. Bowles Seattle
Klickitat-Skamania Counties Society		President, J. L. Harris Stevenson	Secretary, W. C. Trowbridge Goldendale
Lewis County Society	Second Monday—Centralia and Chehalis	President, H. B. Cravens Pe Ell	Secretary, Rush Banks Centralia
Lincoln County Society		President, Glen Snyder Odessa	Secretary, C. S. Baumgarner Davenport
Pacific County Society	Third Saturday—Raymond and South Bend	President, O. R. Nevitt Raymond	Secretary, G. A. Tripp South Bend
Pierce County Society	Second and Fourth Tuesdays—Tacoma	President, R. C. Schaeffer Tacoma	Secretary, W. B. Penney Tacoma
Skagit County Society		President, George Crabtree Mt. Vernon	Secretary, W. N. Hunt Burlington
Snohomish County Society	First Tuesday—Everett	President, E. M. Adams Everett	Secretary, W. F. West, Jr. Everett
Spokane County Society	2nd and 4th Thursdays—Spokane	President, W. J. Pennock Spokane	Secretary, D. A. Palmer Spokane
Stevens County Society		President, H. F. Craig Marcus	Secretary, W. H. Gray Colville
Thurston-Mason Counties Society		President, E. B. Londin Olympia	Secretary, J. L. Paine Olympia
Walla Walla Valley Society	2nd Thursday—Walla Walla	President, F. M. Campbell Walla Walla	Secretary, G. O. Daniels Walla Walla
Whatcom County Society	First Monday—Bellingham	President, L. P. McCalla Bellingham	Secretary, John McGregor Bellingham
Whitman County Society		President, A. T. Lukins La Crosse	Secretary, P. G. Weisman Colfax
Yakima County Society	Second Monday—Yakima	President, Kay England Yakima	Secretary, Ralph Shirey Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology		President, W. F. Hoffman Seattle	Secretary, F. A. Brugman Seattle

ANNUAL MEETINGS OF MEDICAL SOCIETIES

NAME	Meetings Held		
American Medical Assn.	May 9-13. 1932—New Orleans, La.		
Pacific Northwest Medical Association	June, 1932—Spokane	President, G. W. Swift Seattle	Secretary, Frederick Epplen Seattle
Idaho State Medical Assn.	Sept. 29-30, 1931—Boise	President, D. E. Cornwall St. Maries	Secretary, H. W. Stone Boise
Oregon State Medical Society	Oct. 22-24, 1931—Eugene	President, T. E. Griffith The Dalles	Secretary, F. D. Stricker Portland
Washington State Medical Assn.	1932—Tacoma	President, H. J. Whitacre Tacoma	Secretary, C. H. Thomson Seattle
University of Wash. Extension Course	1932—Seattle		
North Pacific Pediatric Society	1932—Seattle	President, E. D. Kanaga Tacoma	Secretary, H. T. Clay Tacoma
Pacific Coast Oto-Ophthalmological Society	1932—Seattle	President, W. F. Hoffman Seattle	Secretary, J. F. Friesen Los Angeles
Pacific Northwest Orthopedic Assn.	November 5, 1931—Vancouver, B. C.	President, F. P. Patterson Vancouver, B. C.	Secretary, Chas. McClure Portland, Ore.

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  Dressed in his old fashioned seedy clothes,
Sat by the fire and dreamed the while.
  He was old and feeble and out of style.

Lame and broken, about half blind,
  Passed by the world and left behind.
Uncared for, worthless, he'd had his day;
  Ought to be dead and out of the way.

And he sat and dreamed in his wingbacked chair,
  Wrinkled his brow by thought and care;
Sat and dreamed of the long back trail,
  And the work he'd done when he must not fail.

Did it alone; yes, and did it all:
  No handy consultant on whom to call.
Invent a way, if no way was known.
  Did a good clean job, and did it alone.

And so he dreamed, on that winter's day
  Of times that had long since passed away.
Old and crippled and nearly blind,
  Passed by the world and left behind.

An old back number, youngsters say,
  All that was left of old Doc K.
Strange stories the oldsters sometimes tell
  Of old Doc K, and they knew him well.

When all the country was rough and new,
  And the roads were bad and the bridges few,
Old Doc K and his old gray mare
  Could be seen a-lopin' most anywhere.

The rivers made no odds to him.
  If he couldn't ford he could always swim;
And whether 'twas snow or sleet or rain,
  He somehow got there just the same.

With his saddle bags and his old gray mare
  In the hour of need he was always there.
For thirty miles on every side
  They knew the mare that he used to ride.

Knew the far off welcome clippity clop,
  As the doctor came at a good round trot.
Out of the storm on a winter's night,
  To the mean small room. How their eyes
    grew bright.

And they lost their terror and doubt and fear,
  As Doc came in, bringing hope and cheer.
Kind and gentle, with loving touch,
  The things that hurt didn't hurt so much.

Helper, councillor, brother and friend,
  Always ready his aid to lend.
"True as steel," the old folk say,
  And they love to tell of old Doc K.

Tell you about his old gray mare.
  How they never failed, but were always there
In the hour of darkness and peril and pain.
  He never refused and he always came.

Everyone feared his cold sharp knife,
  But he gave to hundreds health and life.
Sometimes a little rough, they say,
  But that was nothing, 'twas old Doc K.

For three score years he played the game.
  Gathered but little of wealth or fame.
Freely to others his life he gave
  With never a thought of himself to save.

He tried to win, but he sometimes lost.
  There was never a thought of danger or cost.
He played his best, but his hands were tied,
  For he played with Death on the other side.

And the game was crooked, with loaded dice
  And some of the plays were not just nice.
And Death sat grinning across the way
  And all he could do was to grin and play.

Grit his teeth and just stand the gaff,
  Smile when he won, when he lost just laugh.
No use to mope or cry or complain,
  Just sweep off the board and try it again.

Always the stakes were big for then
  He was playing with Death for the lives
    of men;
Son or father, daughter or wife,
  He played with Death for a human life.

Played with Death with those crooked dice
  In a game where the play was not always nice.
And now he was done and all worn out,
  He wondered just what it was all about.

Old, discarded, lame and blind,
  Passed by the world and left behind.
An old back number, all out of style.
  Had that grim hard game ever been
    worth while?

Ah, who can say till the game is o'er,
  What loss, what gain or the final score.
There are lives that he saved that are living still;
  There are lives unborn that will come until

The world is old and his very name
  And work are forgotten, for such is fame.
Well, the game was over and done and passed.
  Just one more throw, it will be his last.

And he pondered it all with a calm wise smile.
  Had his poor little game ever been worth
    while?
Then he picked up the dice with his hand
    so thin.
  Just one throw more, and old Death
    should win.

When his man came in, he found him there,
  Just fallen asleep in his wingback chair.
His pipe was cold and the fire was out.
  Perhaps he knew what 'twas all about.

G. W. Kennicott.

HEREDITY ALONE IS NOT RESPONSIBLE FOR EPILEPTICS

Only Tendency May Be Transmitted

Epilepsy might be considered a symptom of a disease rather than a disease, in the opinion of Dr. William G. Lennox, author of an article on epilepsy in the October *Hygeia.* The underlying factors seem to differ in various cases.

Though it is generally believed that heredity is the most important factor, Dr. Lennox states that heredity has long been overemphasized. He asserts that epilepsy is hereditary in the same manner as are other morbid conditions, including cancer and kidney disease, that is, that the tendency or susceptibility is inherited.

The most important causes are injuries to the central nervous system, which may occur at birth or later in life. A third cause is found in abnormalities outside the brain which produce strain on the brain. Among these are constipation, poor posture, eyestrain, foci of infection and defective circulation.

The first and best treatment is in removing these last straws that often break the camel's back, writes Dr. Lennox. The physical defects should be remedied; the diet should be varied and marriage of epileptics should be discouraged for those persons who come from deteriorated physical or mental stock.

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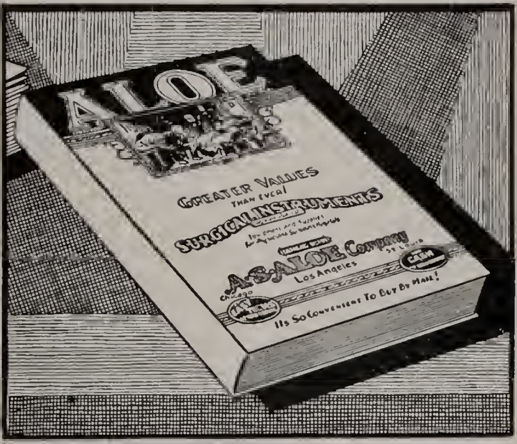

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TEMPERATURE VARIES IN BIRDS, ANIMALS, MAN AND WITH TIME OF DAY

Dr. Norman Plummer defines fever in the November issue of *Hygeia* as a "condition occurring in warm-blooded animals in which the body temperature is higher than normal. The normal body temperature of animals differs. Birds maintain a normal temperature at from 104 to 107.6 F., whereas the rabbit varies from 102 to 104 F. Man's normal temperature is 98.6 F., but the temperature may vary in parts of the body and at different times of the day as much as a degree.

"Fever is classified according to its degree of elevation, its daily fluctuation and the severity of the reactions of the body. These variations in fever," the author explains, "depend principally on the causative factor. For example, the type of fever seen in pneumonia, which is caused by a certain micro-organism, is very different from that noted in malaria in which another organism is present."

Temperature regulation depends on the relationship between the amount of heat produced and the amount of heat eliminated from the body.

Extremely high temperature, such as in heat-stroke, is actually harmful and may cause death. Slight elevation in temperature, however, apparently does no harm. Cold sponges and antipyretic drugs will reduce fever.

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Secretary, A. J. Browning
Portland

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Wenatchee
Secretary, A. G. Young
Wenatchee

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Secretary, F. A. Brugman
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ANNUAL MEETINGS OF MEDICAL SOCIETIES

NAME ...... Meetings Held

American Medical Assn......May 9-13. 1932—New Orleans, La.

Pacific Northwest Medical Association......June, 1932—Spokane
President, G. W. Swift
Seattle
Secretary, Frederick Epplen
Seattle

Idaho State Medical Assn......1932—Pocatello
President J. N. Davis
Kimberly
Secretary, H. W. Stone
Boise

Oregon State Medical Society......1932—Klamath Falls
President, E. L. Zimmerman
Eugene
Secretary, A. W. Holman
Portland

Washington State Medical Assn......1932—Tacoma
President, H. J. Whitacre
Tacoma
Secretary, C. H. Thomson
Seattle

University of Wash. Extension Course......1932—Seattle

North Pacific Pediatric Society......1932—Seattle
President, E. D. Kanaga
Tacoma
Secretary, H. T. Clay
Tacoma

Pacific Coast Oto-Ophthalmological Society......1932—Seattle
President, W. F. Hoffman
Seattle
Secretary, J. F. Friesen
Los Angeles

Pacific Northwest Orthopedio Assn......November 5, 1931—Vancouver, B. C.
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Corrections and additions to this list are requested from the societies represented.

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Etiology of Influenza: Transmission Experiments in Chimpanzees with Filtered Material Derived from Human Influenza. Perrin H. Long, Eleanor A. Bliss and Harriet M. Carpenter, Baltimore (*Journal A. M. A.*, Oct. 17, 1931), transmitted disorders characterized by fever, prostration and a leukopenia to three chimpanzees by intranasal inoculation with bacteria-free filtrates of rhinopharyngeal washings obtained from individuals ill with human influenza. A similar condition was produced in an ape during a nonepidemic period by means of an intranasal inoculation with unfiltered influenzal material which had been preserved in the icebox for 123 days. The difficulty of interpreting with complete satisfaction the observations made on the apes is obvious, and the authors therefore present the observed facts with the knowledge that they conform with those previously reported in man by other investigators.

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ULTRAVIRUS HAS LITTLE MEANING IN COLD LANGUAGE

Who has escaped having a cold? Who has escaped having two colds, three, or four? Few indeed. There seems to be complete absence of immunity from them. Chickenpox, measles, diphtheria we may have escaped altogether or have had once, but the common cold is caught time after time.

The cold is caused by a filtrable virus of which so little is known that the field for scientists is still enjoyable. Absolutely nothing is known of their structure, chemical composition or life history, according to Dr. R. R. Spencer, author of "Cold Facts About Colds," an article appearing in the November *Hygeia*. Dr. Spencer add:

"No one has ever seen, heard, smelled, tasted or touched an ultravirus, and only the trustful public gets a kick out of the announcement that science has 'discovered' an invisible, intangible, unsmellable, untasteable and inaudible virus."

The U. S. Public Health Service estimates that 90,000,000 work days per year in this country are lost by the common cold. At $5 per day, a loss of about $450,000,000 is incurred.

Tables show that the cold is particularly prevalent in childhood and decreases with age; in older persons, however, it runs a more severe course.

The common cold brings about complications of throat, nose, eyes and ear inflammation because it lowers the resistance of the person. It gives rise to respiratory diseases often.

No specific treatment or preventive has as yet been found that is effective at all times. Numerous remedies have been suggested, such as quinine, whisky, bicarbonate of soda, iodine in small doses, inhalations of chlorine gas, injections of nuclein to stimulate the production of white blood cells, and various bacterial vaccines.

CHEESE HISTORY GIVES FLAVOR TO NUMEROUS COMMERCIAL VARIETIES

"Once upon a time an Arab herdsman set forth on a long, hot journey carrying his ration of milk in a bag made from the partly dried stomach of a calf or a sheep. At the end of a goodly portion of his trip he stopped to eat his dates and drink the milk. But to his amazement, the fluid he secured from the carrying pouch was clear and transparent and in the bag was a large mass of solid white material. He tasted this and found it good. He probably told his friends and they tried it, then squeezed it quite dry and gradually experiments and local bacteria played a part in modifying the flavor."

This is the story Miss E. M. Geraghty tells in the November *Hygeia* of the first use of cheese.

LAVERAN DISCOVERED MALARIA GERM IN 1880

To one who finds pleasure in the laboratory of science, the administrative duties of an army surgeon seem irksome, and so it was to Charles Louis Alphonse Laveran, born in Paris on June 18, 1845.

Dr. Claude Lillingston in his series of articles, "Pioneers of Medicine" in *Hygeia* describes clearly the steps in the life of Laveran. In Algeria where he was attached to a military hospital, Laveran studied malaria. His discovery of the malaria germ was not enthusiastically received. What was particularly difficult for his contemporaries to accept in Laveran's report was that malaria was due to a parasite belonging to the animal world. In those days the scientific world was thinking only in terms of the newly discovered bacteria.

In 1897 he and Manson suggested various clues to Ronald Ross who traced the parasites to the stomachs of two mosquitoes. Then Laveran realized that to put an end to malaria meant the destruction of the breeding places of the mosquito.

Prostatic Obstruction: Electrocardiographic Study of Three Hundred and Twenty-one Cases. In a study of 321 cases of prostatic obstruction Charles M. Bacon, Herman L. Kretschmer, Chicago, and Lewis W. Woodruff, Joliet, Ill. (*Journal A. M. A.*, Oct. 24, 1931), demonstrated the frequency of myocardial disease. There were 35.8 per cent with heart disease in the group of all ages. The frequency of left axis deviation and myocardial disease in relation to age showed a progressive increase in these conditions with advancing years. Of a total of 115 with heart disease, 90, or 78 per cent, showed abnormal electrocardiograms. Emphasis is laid on the preoperative and postoperative care and choice of anesthetic in patients with cardiac disease. Four postoperative deaths due to heart disease are analyzed. A series of forty-seven patients returning sometime after operation showed in general considerable improvement in cardiac function as a result of the relief obtained by surgery. From their electrocardiographic study the authors are convinced of the value of recognizing preoperatively the presence of cardiac disease in patients with prostatic obstruction irrespective of clinical cardiac signs. The electrocardiogram is, however, an aid, not the final criterion, in the diagnosis of myocardial disease.

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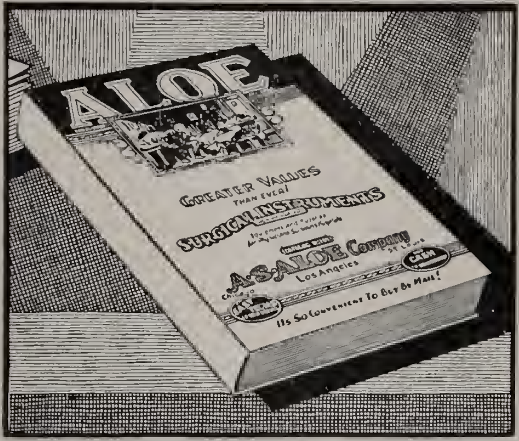

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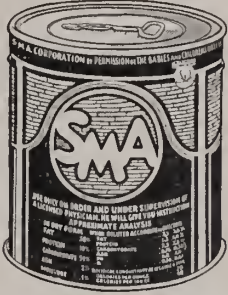

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SHOULD COD LIVER OIL BE FLAVORED?

It is a well known fact that young infants shy at aromatics. Older patients often tire of flavored medications to the point where the flavoring itself becomes repellant. This is particularly true if the flavoring is of a volatile nature or "repeats" hours after being ingested. Physicians have frequently used the terms "fresh," "natural," "sweet," and "nutlike" in commenting upon the fine flavor of Mead's Standardized Cod Liver Oil. They find that most patients prefer an unflavored oil when it is as pure as Mead's. Physicians who look with disfavor upon self medication by laymen are interested to know that Mead's is one standardized cod liver oil that is not advertised to the public and that carries no dosage directions on carton, bottle or circular. Mead Johnson & Company, Evansville, Ind., pioneers in vitamin research, will be glad to send samples and literature to physicians only.

PRESENT STATUS OF ANESTHESIA PROBLEM. Arthur Dean Bevan, Chicago (*Journal A. M. A.*, Nov. 21, 1931), reviews briefly the subject of anesthesia, tests the various anesthetic agents by the scheme of measurement which his associates and he have devised, and attempts in a judicial way to determine what anesthetics are today the safest, most efficient and most practical for use in a general surgical clinic. He believes that the use of chloroform, of intraspinal anesthesia, of intravenous anesthesia, of intrarectal anesthesia, of intratracheal anesthesia and of the so-called basic anesthetics, such as scopolamine, avertin and amytal must be limited to very narrow fields. Fortunately, local anesthesia, gas anesthesia and ether afford three anesthetic measures which, if handled by an expert can be used alone or in sequence, with abolition of pain and, if desired, the abolition of consciousness and, when required, complete relaxation, and can secure complete and safe anesthesia for any and all surgical operations.

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Rexburg   Rigby

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President, N. L. Tartar   Secretary, Henry Garnjobst
Corvallis   Corvallis
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Baker   La Grande
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Lane County Society......
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Salem   Salem
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Portland   Portland
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Tillamook   Tillamook
Umatilla County Society......
President, E. O. Parker   Secretary, G. L. McBee
Pendleton   Pendleton
Union County Society......
President, W. R. Ross   Secretary, Lewa Wilkes
La Grande   La Grande
Yamhill County Society......
President, J. G. Manning   Secretary, Zilpha Galloway
McMinnville   McMinnville
Oregon Ophthalmological and Oto-Laryngological Society......
......Third Tuesday—Good Samaritan Hospital
President, J. L. McCool   Secretary, A. J. Browning
Portland   Portland

WASHINGTON

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Wenatchee   Wenatchee
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President, R. S. Hamilton   Secretary, W. H. Taylor
Port Angeles   Port Angeles
Clark County Society......Second Tuesday—Vancouver
President, A. E. Bird   Secretary, J. A. Darby
Camas   Vancouver
Cowlitz County Society......
President, L. S. Roach   Secretary, A. F. Birbeck
Kalama   Longview
Grays Harbor County Society......
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Aberdeen   Aberdeen
Jefferson County Society......
President, J. F. Delaney   Secretary, H. C. Miller
Port Townsend   Port Townsend
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Seattle   Seattle
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President, J. L. Harris   Secretary, W. C. Trowbridge
Stevenson   Goldendale
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Pe Ell   Centralia
Lincoln County Society......
President, Glen Snyder   Secretary, C. S. Baumgarner
Odessa   Davenport
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President, O. R. Nevitt   Secretary, G. A. Tripp
Raymond   South Bend
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Tacoma   Tacoma
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President, H. J. Greer   Secretary, L. J. Ferrell
East Stanwood   Everett
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Walla Walla   Walla Walla
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President, A. T. Lukins   Secretary, P. G. Weisman
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Yakima   Yakima
Puget Sound Academy of Ophthalmology and Oto-Laryngology......
President, W. F. Hoffman   Secretary, F. A. Brugman
Seattle   Seattle

ANNUAL MEETINGS OF MEDICAL SOCIETIES

NAME   Meetings Held
American Medical Assn......May 9-13. 1932—New Orleans, La.
Pacific Northwest Medical Association......June, 1932—Spokane
President, G. W. Swift   Secretary, Frederick Epplen
Seattle   Seattle
Idaho State Medical Assn......1932—Pocatello
President J. N. Davis   Secretary, H. W. Stone
Kimberly   Boise
Oregon State Medical Society......1932—Klamath Falls
President, E. L. Zimmerman   Secretary, A. W. Holman
Eugene   Portland
Washington State Medical Assn......1932—Tacoma
President, H. J. Whitacre   Secretary, C. H. Thomson
Tacoma   Seattle
University of Wash. Extension Course......1932—Seattle
North Pacific Pediatric Society......1932—Seattle
President, E. D. Kanaga   Secretary, H. T. Clay
Tacoma   Tacoma
Pacific Coast Oto-Ophthalmological Society......1932—Seattle
President, W. F. Hoffman   Secretary, J. F. Friesen
Seattle   Los Angeles
Pacific Northwest Orthopedic Assn......
......November 5, 1931—Vancouver, B. C.
President, F. P. Patterson   Secretary, Chas. McClure
Vancouver, B. C.   Portland, Ore.

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PERMEABILITY OF PLACENTA TO INORGANIC IODIDES. In experiments on rabbits, G. E. Hudson, Minneapolis (*Journal A. M. A.*, Nov. 21, 1931), noted that inorganic iodides, given to the mother, pass through the placenta and are absorbed by the thyroid of the fetus. The thyroids of mothers on a low iodine diet contains an average of 11 γ of iodine per hundred milligrams of tissue. The thyroids of mothers that are given 100 mg. of potassium iodide daily, in addition to a low iodine diet, contain an average of 127 γ per hundred milligrams of tissue. The thyroids of fetuses whose mothers have received a low iodine diet yield an average of approximately 13 γ of iodine per hundred milligrams of tissue. The thyroids of fetuses whose mothers have been given large amounts of potassium iodide in addition to the iodine contained in their diet yield an average of approximately 26 γ of iodine per hundred milligrams of tissue. The amount of iodine obtained from the maternal thyroid of animals receiving potassium iodide seems to vary with the amount given. The amount of iodine obtained from the fetal thyroid varied whether 20 mg. or 200 mg. of potassium iodide was given the mother daily. There seems to be no signifiant increase in the weight of thyroid tissue, with increase in its iodine content. The author believes that if a child with congenital goiter is born of a mother who has received inorganic iodides throughout her pregnancy, it is not because of a deficiency of iodine in the fetal thyroid.

FAMILIAL EPIDEMIC OF ACUTE DIFFUSE GLOMERULONEPHRITIS: RELATION TO PATHOGENESIS OF DISEASE. A. Carlton Ernestene and George P. Robb, Boston (*Journal A. M. A.*, Nov. 7, 1931), record a familial epidemic of acute diffuse glomerulonephritis not due to scarlatina. Eight of ten children successively developed an acute infection of the upper respiratory tract and, in six, symptoms and signs of acute diffuse glomerulonephritis appeared during convalescence.

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WEE MODERNS

By Berton Braley

The babies of these present days are raised upon a system,
You count their calories of food and on a card you list 'em;
They're spanked upon a schedule and petted by the clock
And you mustn't ever jounce 'em and you mustn't ever rock;
Physicians choose their style of dress and fix their hours of sleep
And tell you when they ought to laugh and when they ought to sleep,
Their every eccentricity is catalogued and filed,
For the modern type of baby is a scientific child!

Time was that mother raised them in a rather casual way,
With a bit of help from grandma—but that isn't done today;
The bringing up of babies is a far from simple art,
And you need a dozen volumes and a blueprint and a chart,
A clinical thermometer, a stethoscope, a scale,
Some test tubes and a dictaphone that registers each wail,
The modern mother's regimen is very far from mild,
For the baby of the present is a scientific child!
Oh, yes, I am describing the *modern* baby now!

Oh, the old folks sniff about it and the jesters jest a lot,
But the modern type of baby is a healthy little tot;
He may be robbed of baby-talk, of many pats and kisses,
But there's a heap of colic and other ills he misses;
And in spite of all the sentiment that in our cosmos lurks,
There isn't any question that the modern method works—
For the scientific baby is a husky little tad,
A credit to the doctor, and the mother, and the dad!

(Copyright, S.M.A. Corporation, Cleveland, O.)

S.M.A. is frequently prescribed for modern infants because it is recognized by most physicians to be the nearest existing approximation of mother's milk. No directions are given on the lay package. Moreover, each can bears this statement: "Use only on order and under supervision of a licensed physician. He will give you instructions." It is an ethical product, being advertised only to the medical profession and sold exclusively through prescription pharmacies.

HYGEIA ARTICLE EXPLAINS REQUIREMENTS FOR SANITARY DRINKING

Do you know that vertical-jet drinking fountains retain the disease germs of one drinker and serve them to the next? Four studies even before 1920 settled this point, and yet in modern schools, offices, and public buildings vertical-jet drinking fountains are constantly being installed. This type of fountain is as dangerous as the common drinking cup so abhorred by the general public today!

An article by Marie Correll in the December issue of *Hygeia* entitled "Those Dangerous Drinking Fountains" explains in detail how the ideal fountain should be constructed. The bubbling fountain should first flow from an angle so that the water does not touch the jet after it has once spouted out. This prevents disease germs from falling back on the jet.

Second, a guard should be placed above the jet to prevent a person from touching the nozzle. These two suggestions will insure cleanliness on ordinary occasions. But what if the bowl should clog? In an instance like this the spouting water would have to run through the used overflow. This would not be sanitary. For this reason the jet and guard should be placed higher than the top edge of the bowl. Then if clogging occurs and overflowing results, the jet can still pour forth without becoming contaminated by the overflow. Moreover, it is better if the water does not splash in the bowl because it may not be clean.

"Although almost no action has been taken by state health authorities or state departments of labor requiring that drinking fountains be angle-jet, it is encouraging to know that in nineteen states angle jet fountains are recommended as being more sanitary than vertical-jet ones," the article concludes.

SCHOOL SHOULD PROVIDE IDEAL OPPORTUNITY FOR PREVENTION OF DISEASE

The schools provide the ideal center for the control of tuberculosis, because it is among 'teen age boys and girls that the disease is most prevalent. Economy alone is sufficient reason for the use of school and state funds to prevent tuberculosis. The greatest reason for control, however, lies in the health of future citizens. Dr. J. Arthur Myers offers valuable suggestions as to the control and causes of tuberculosis in the 'teen age in the December *Hygeia*.

When the school cannot reach all boys and girls of the 'teen age in its enrollment, it should be used as a demonstration center, as an aid to the medical profession and as a center of health instruction.

As a contagious disease, tuberculosis is a community disease endangering the lives of all. It can be stamped out only by careful examination and treatment; from the point of view of health, a program cannot be too stringent.

WEATHER MAKER PRODUCES MAGIC WITH INDOOR AIR

The notion that one has only to open wide the window to get pure air has long been exploded, but pure air can be obtained by the indoor weather maker. This can be accomplished by keeping all windows and doors tightly closed. Queer, isn't it, but this is how it is accomplished.

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Hay fever and bronchial affections are not at all troublesome to the person in air-conditioned rooms, because the dust is not present in the air.

PITUITARY THERAPY OF ALOPECIA: PRELIMINARY REPORT. Five years ago, while Bengt Norman Bengston, Maywood, Ill. (*Journal A. M. A.*, Nov. 7, 1931), was resident at the Research and Educational Hospital of the University of Illinois, a woman with Froehlich's syndrome was treated with various pituitary preparations. During the treatment, she developed a luxuriant hair growth, in addition to regaining her normal sexual desires, reestablishing her menstrual cycle, and losing weight. The growth of hair was particularly remarkable in that the patient and her immediate female relatives (mother and two sisters) all had, since early youth, a scanty atrophic type of hair, prone to dryness and easy end-splitting. Inferring a relationship of the pituitary therapy to this patient's hair growth and its change in texture, the author began to study the effects of certain pituitary preparations in cases of alopecia. He reports on sixteen patients, in all of whom the results were so striking that a preliminary report seemed desirable to render this treatment available for investigation by others, in spite of the relatively small number of cases. It seems that coincidence could be ruled out by the uniform success in these sixteen patients, most of whom tried (one over a period of twenty-three years) various kinds of other treatments. The patients were taken in order of admittance and treated without preference or selection. The results secured might be anticipated on theoretical consideration. An endocrine motor mechanism for the growth of hair must *a priori* be postulated, and, in view of the intimate association of the sex glands to the development of hair and of the pituitary to the sex glands, this mechanism might reasonably be looked for among these glands. On the basis of his observations the author concludes that a definite therapeutic relationship seems established between certain alopecias and the pituitary gland preparations used. The anterior lobe was in most of the cases the sole influence in producing the growths of hair obtained. The hypodermic use of pituitary gland secured more satisfactory and more rapid hair growth than oral administration, which on the whole is disappointing.

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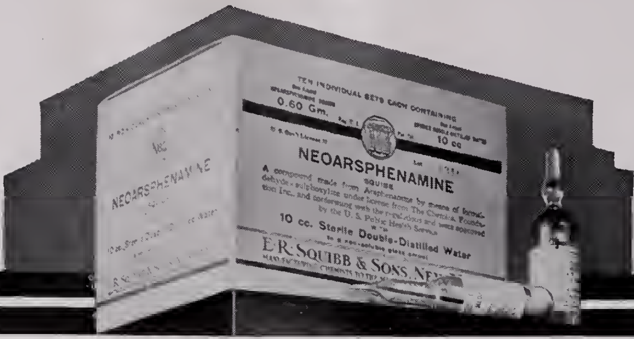
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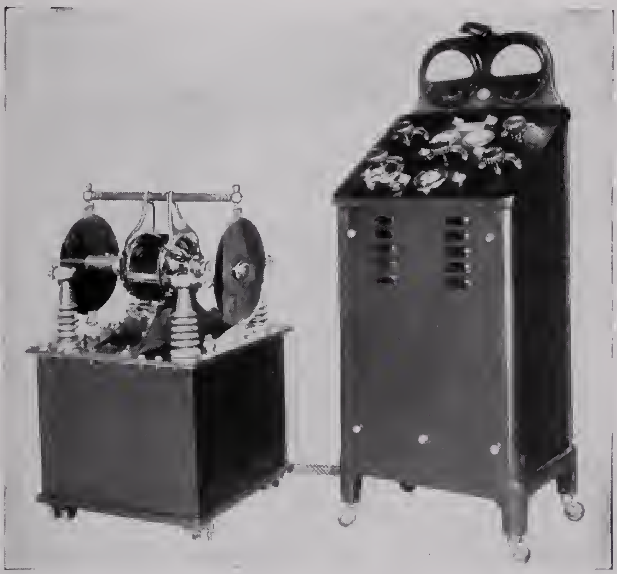

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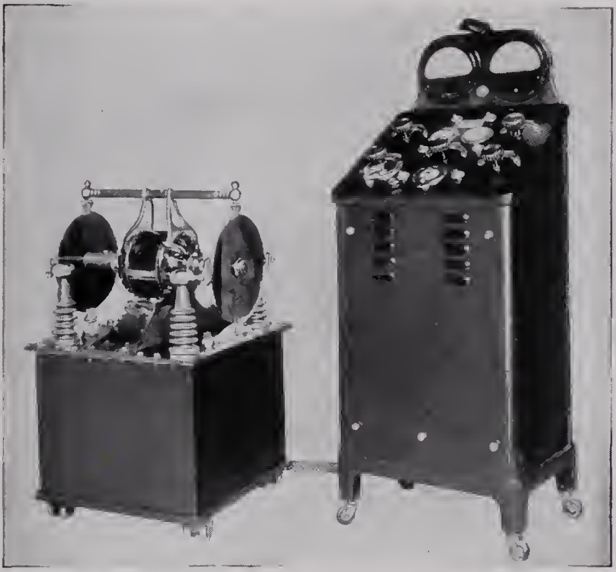

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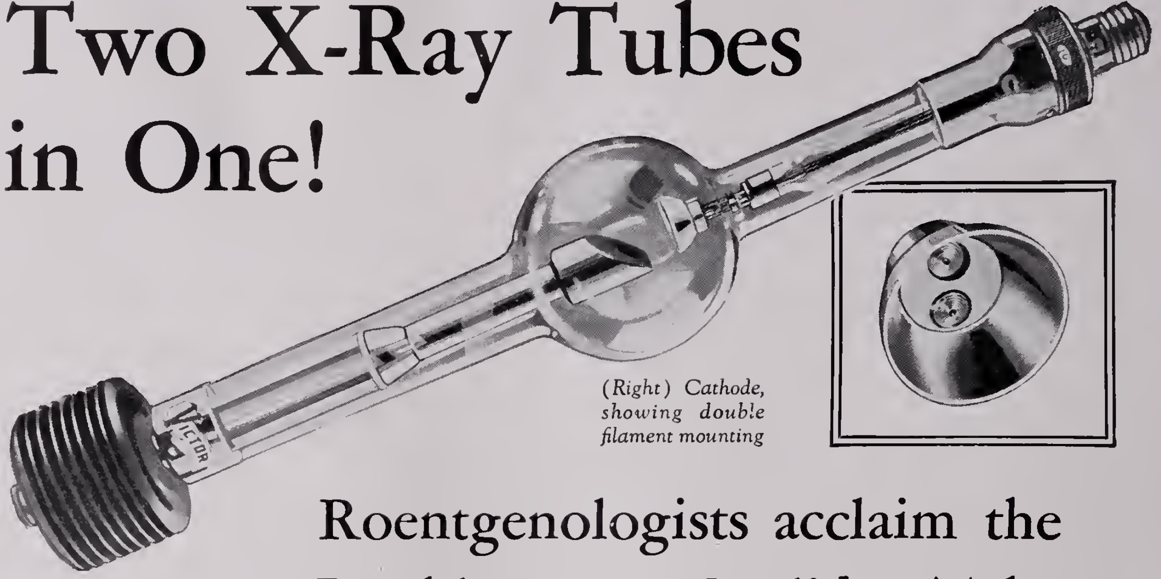

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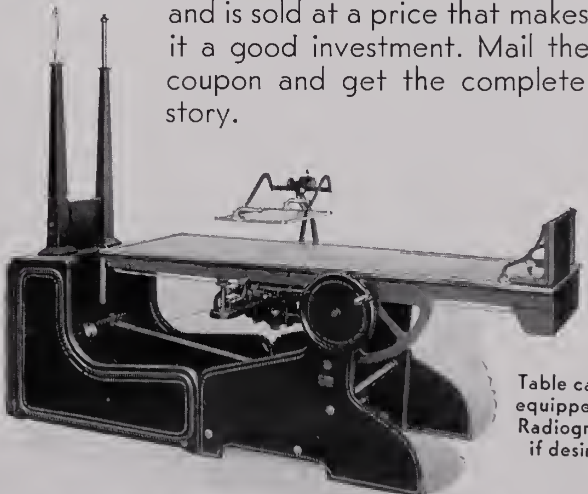

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¼ cup cold water	....	....	....	....	....
1⅓ cups hot water	....	....	....	....	....
1 teaspoonful whole mixed spices	....	....	....	....	....
½ teaspoon salt	....	....	....	....	....
⅓ cup vinegar	....	....	....	....	....
½ cup chopped cabbage	50	1	....	3	....
½ cup chopped celery	60	1	....	2	....
¼ cup canned green peas	40	1	....	4	....
¼ cup cooked beets cubed	40	1	....	3	....
Total		10	....	12	88
One serving		2	....	2	15

Soak gelatine in cold water for five minutes. Bring to boil water, salt and spices. Pour on gelatine to dissolve it and add vinegar. Strain and set aside to cool. When jelly is nearly set, stir in the vegetables, pour into mold and chill until firm. Unmold on lettuce leaf or shredded lettuce and serve with mayonnaise or salad dressing. Garnish with sprig of parsley or strip of pimento.

CHOCOLATE PUDDING

(Six Servings)

	Grams	Prot.	Fat	Carb.	Cal.
1½ tablespoons Knox Sparkling Gelatine	10	9	....	....	....
¼ cup cold water	..	. .	....	....	....
2 cups milk	480	14	19	24	....
¾ cup boiling water	....	. . .	....	....	....
1 square chocolate grated (1 oz.)	30	4	15	9	....
Pinch salt	....	....	....	....	....
Pinch cinnamon	....	....	....	....	....
¼ teaspoon vanilla	....	....	....	....	....
1 gr. saccharin	....	. .	. . .	....	....
Total		27	34	33	546
One serving		4.5	6	5.5	91

Soak gelatine in cold water five minutes. Melt chocolate in boiling water. Add gelatine and stir until dissolved. Add milk, salt, cinnamon, vanilla and saccharin. Stir well and chill. When nearly set, beat until frothy, mold and chill until firm. Serve plain or with thin cream or whipped cream.

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by

Paul T. Shaw

For twenty-five years we have been engaged in buying and selling electro-medical equipment. As *independent dealers* (not a factory branch office) we have had opportunity to compare the various types of equipment on the market—and select for sale by our company those lines of equipment which have attained places of *pre-eminence* in the medical field. The experience gained in this record of a quarter of a century of uninterrupted service has qualified our organization to judge the intrinsic merit of medical equipment.

The one outstanding fact which this experience has taught us is this, viz.:

The manufacturer who concentrates his efforts on a particular modality, very naturally becomes an expert in this particular field. Given the brains and fair capital, such manufacturers very shortly "run away" from the field of competitors who are spreading their efforts over the entire electro-medical line. In other words, there are "Specialists" in the manufacturing field—just as there are "Specialists" in medicine. There are a number of these "Specialists" in the manufacturing field who have attained world-wide recognition for the superiority of their products. Superiority in workmanship; superiority in design; superiority in the choice of materials entering into their prodcuts, and SUPERIORITY IN PERFORMANCE.

There is just as wide a variation in the quality of medical appliances as there is in the automobile field. Yet we find too often that the physician or hospital superintedent is disposed to assume that all x-ray machines are of equal value; that all sterilizers are the same; that all ultra-violet ray lamps produce identical results; or that all diathermy machines produce therapeutic modalities of exactly similar characteristics. Nothing is farther from the truth, however.

The sale and distribution of medical and surgical supplies presents an anomalous situation, viz.: The medical and hospital fraternity pride themselves (justly) on being scientific men and women. They are faultlessly exacting in the technique and routine of matters medical and surgical. But too often when it comes to the matter of the selection of equipment—particularly electro-therapeutic equipment—all science is "thrown to the wind" and selection is made on the basis of either price, sentiment or personal prejudice. I have seen this demonstrated time and time again. Perhaps it will always be the prevailing procedure. But the unfortunate feature of the matter is that it is not the buyer who is most injured. The patients, who ultimately pay for all supplies and appliances, are those who suffer most.

The plea which I make is simply this: The markets are flooded with various and sundry electro-medical and surgical appliances. There are good—there are better—there are best grades. It is a really simple matter to ascertain the relative merits of all. If you fail to select your therapeutic and surgical equipment on a *scientific* basis you cannot justly claim to be a scientific man.

The company which I represent has made a scientific investigation of the important lines of equipment it offers for sale. And it is my privilege to state boldly without fear of contradiction by the most exacting methods of research known to science that the following lines of appliances are superior to all others of their kind on the American market. To back this statement up with performance we invite, yes, we crave opportunity to demonstrate this equipment side by side that of any other in the world.

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Ultra-Violet Light	BURDICK
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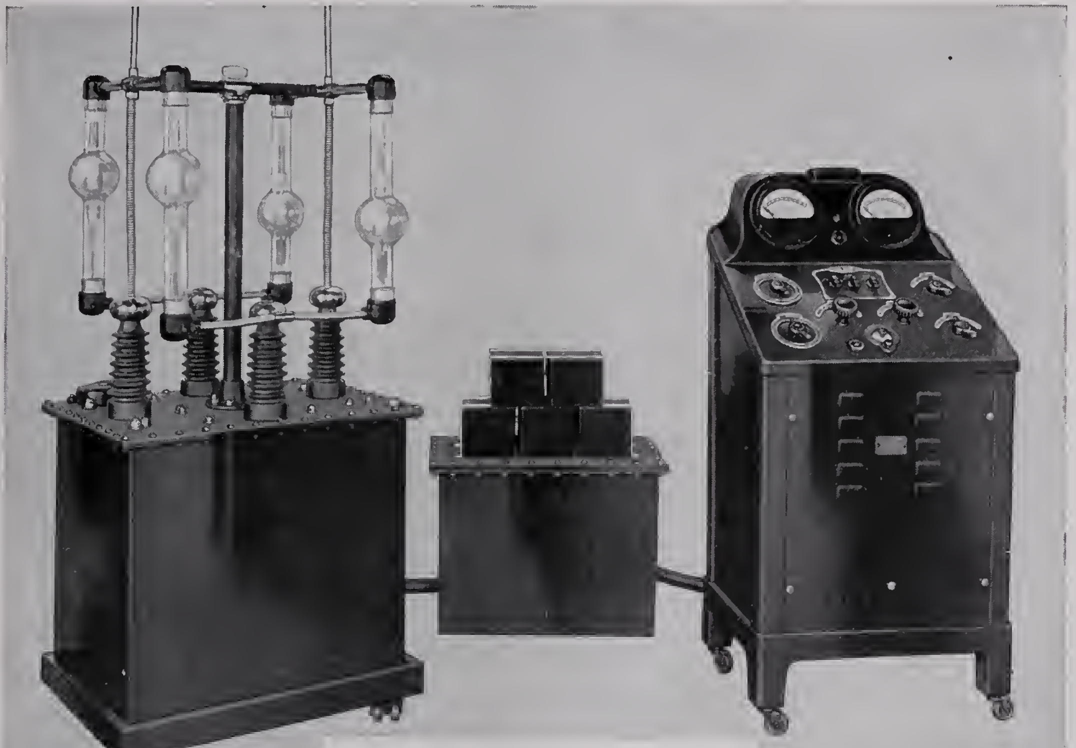

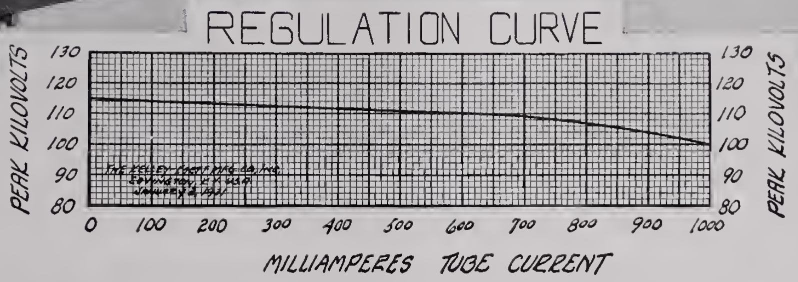

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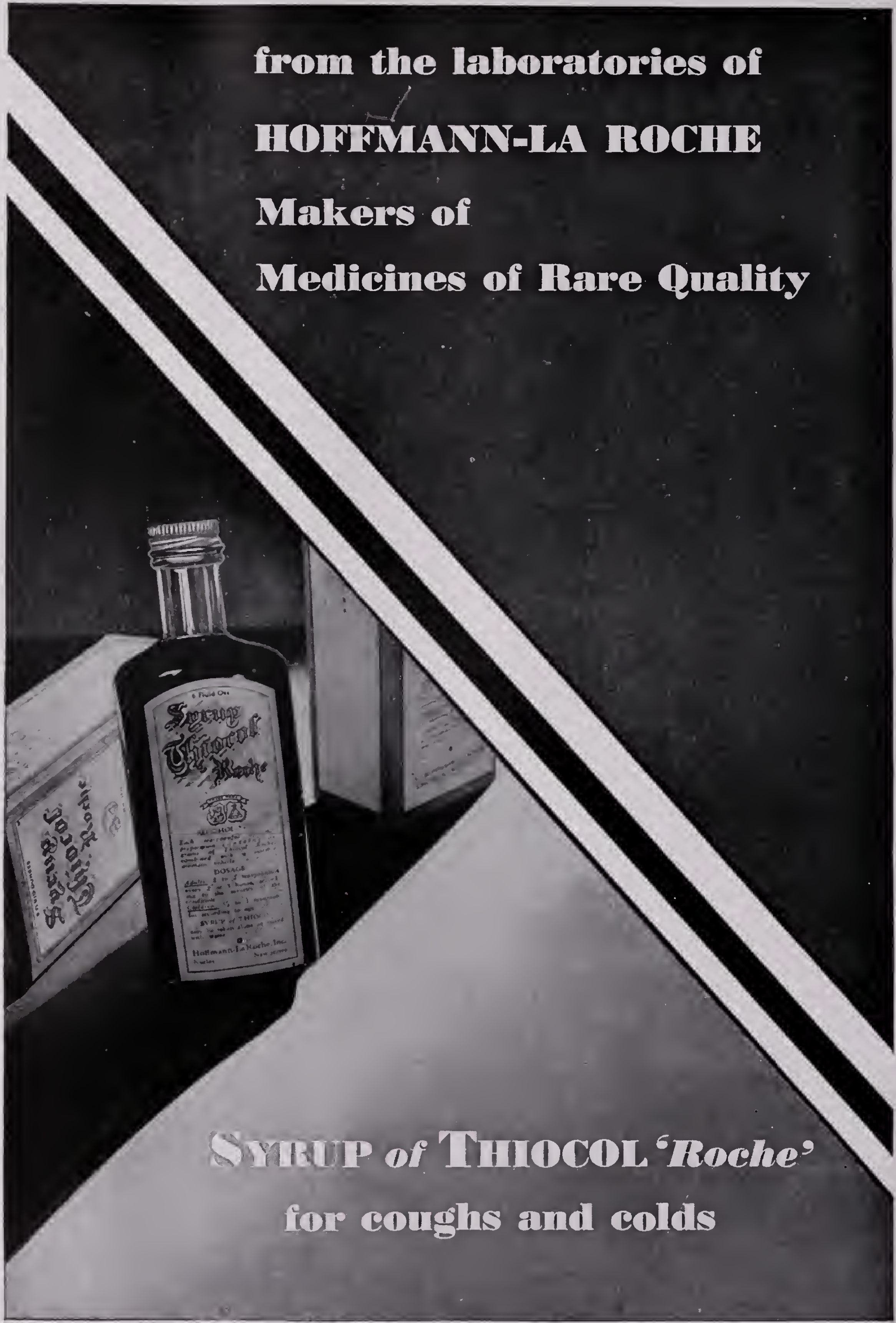

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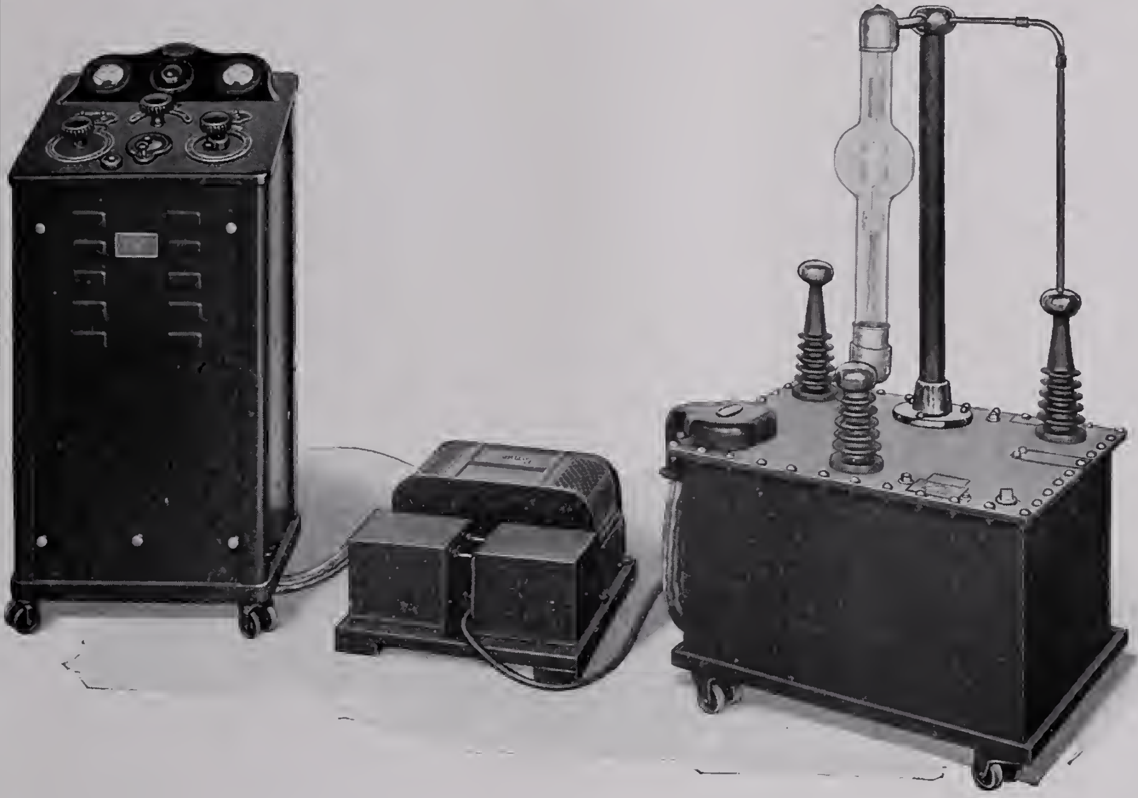

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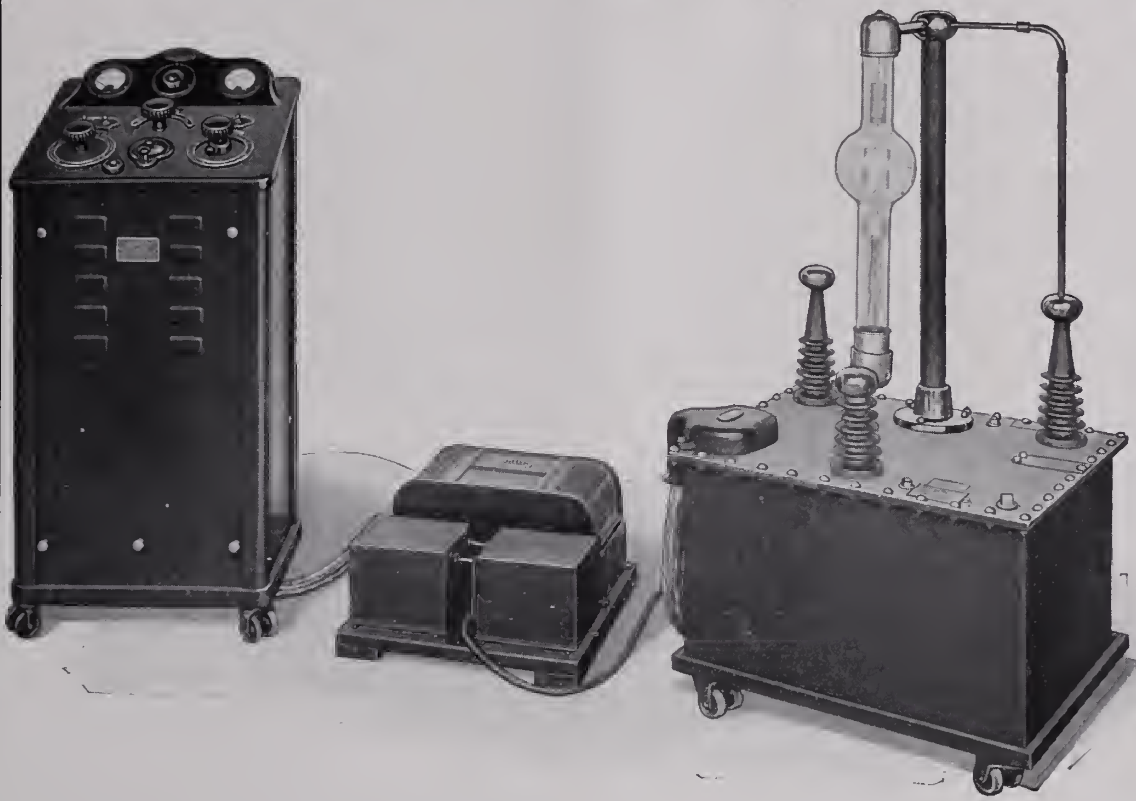

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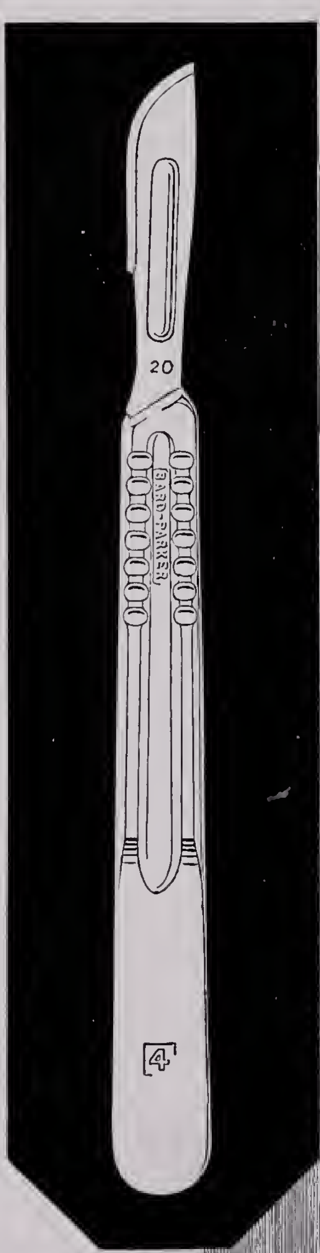

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